ORGANIC GARDENING

APRIL 25¢ 1946

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With The Editor

The Wonderful Grape

MY interest in grapes was aroused many years ago when I read of cancer cures being effected on exclusive grape diets and that there were sanatoriums all over the world where the grape cure was administered. While laying out our gardens I made sure that grape vines were plentifully represented. The grape is simple to grow, responds readily to compost, benefits one's health immeasurably and is often overlooked by the gardener. It does not come within the province of this editorial section to discuss individual plants, unless there is something either outstandingly good or extremely bad about it and I can guarantee that there is something wonderful about the grape.

It is known since the days of antiquity and is referred to copiously in the Bible. Pliny the elder wrote about the value of grapes as a means to cure disease. Poets have sung about its wondrous qualities. Many great races have shunned water and lived only on wines made of grapes.

The grape is a whole food. It contains the seed, the skin and the general interior. None of the vital parts are removed as in bread-making. It is marvelously rich in the right kind of natural, healthful sugars and is full of organic minerals, especially if grown with compost. I have stood at the vine in late summer and consumed dozens of bunches of grapes at one standing, skin, seeds and all, amidst the exquisite aroma of the divine fruit and leaves of this vine. I have done this instinctively, impelled by no earthly reason, and have attained the topmost heights of the pleasure of the palate.

Looking at it from a mundane and more practical viewpoint, when eaten later, there is a loss in the vitimin content. If the whole family can take their grapes right at the vine in big quantities it will give them a wonderful fortification against the rigors and hardships of winter with its attendant colds and other ills. I suggest that, as against the losses incurred in making wine. However, if there is sufficient to do both, so much the better. Wine in moderation can harm no one. Jesus drank it.

There is an old fallacy that eating the seeds of grapes causes appendicitis. This has been long ago exploded by the medical profession but there have been some cases where cases of colic in children have been traced to it. For a dozen years now I have consumed seed and all with no bodily complications occurring. I strongly recommend the inclusion of the seed in the diet. They not only exert an excellent massage-like action upon a sluggish intestine, but contain valuable minerals, some of which is left in the system even after the seeds may

be expelled. Some of the seeds may be entirely digested. The seed in general as a human food should be looked into because Nature in perpetuating the species through it, endows the seed with the most precious of all nutritional elements.

One of my reasons in writing about the grape at this time is to encourage gardeners to be grape-conscious. If you do not have much room, grow it as an ornamental plant on porches and trellises. Put compost to a distance of about three or four feet from the stem and to secure even better results place a mulch of medium sized stones over the compost.

With regard to purchased grapes there is always the possibility of dangerous residues of poison sprays. It has been suggested that it may be removed with a very weak solution of hydrochloric acid highly diluted in water. One reader used a mixture of lemon juice for this purpose. It is much better to grow your own.

Before leaving the subject I would like to mention a worthy companion to the grape vine, the sunflower plant, not that they have any affinity for each other or should grow side by side. I mention it merely because sunflower seeds also have wonderful health-giving properties. (See our 25-cent booklet—Sunflower Seed, the Miracle Food). Eating loads of fresh grapes in the early autumn and then following through all winter with your own organically produced sunflower seeds will not help your doctor's income much.

There follows herewith a doctor's discussion concerning the advantage of the grape cure. It is from a book published in 1912 by F. A. Davis Co., (Phila.) and was written by a well-known European physician, Arnold Lorand, M. D. The book is called Health and Longevity Through Rational Diet. It will probably be found in your local library and is well worth perusing.

J. I. RODALE

Concerning the Advantages of the Grape Cure

By Arnold Lorand, M. D.

Cajus Pinius already called attention to the value of grapes in many conditions of disease. The fact that they really do have such an action is shown by the statements made in the previous chapter. Since grapes have a stimulating effect upon the intestinal walls, they may induce a daily bowel movement in chronic intestinal constipation and in chronic intestinal catarrh with constipation; in cases of intestinal catarrh with diarrhea and abnormal putrefaction their antiseptic action may come into play. Owing to the high content of sugar, grapes cause acid fermentation—in the same way as do large amounts of carbohydrates—by means of which a decided disinfection of the intestine is accomplished through the agency of the lactic acid produced. Injurious decomposition products are thus destroyed. Owing to this property, as well as through the diminished viscidity of the blood induced, especially in a chiefly vegetarian diet, the grape

cure may also be very useful in a great many cases of arteriosclerosis. A decided diminution of very high blood-pressure was observed in such cures. Favorable results have also been reported, principally by French authors, in many cases of chronic kidney diseases. In gout, obesity, and emphysema, and also in many skin affections accompanying decomposition processes in the intestines, very favorable results were obtained. In diseases of the liver and in gallstones I advise a grape cure in the autumn, following the Carlsbad cure. The quantity to be taken daily is from 1 to 2 kilos, beginning with a small quantity and gradually increasing. The grapes are to be taken in the morning on an empty stomach, then one hour before both the midday and evening meals. That walking in the open air, which can be so agreeably accomplished in lovely Meran, with its wonderful climate, materially assists the cure can be readily understood; walking also plays an important role in other cures. According to my own experience, in spending weeks at a time in Meran, I know that large quantities of grapes, from 1 to 2 kilos, also have a very beneficial action upon a healthy person, especially when the juicy and tender skinned variety to be had in Meran is taken. It is important, however, that during this cure certain dietetic restrictions be observed; foods having an irritating action upon the intestine must not be taken, the use of tobacco and alcohol must be restricted, and beer should be as much as possible avoided. The mouth should always be washed after eating large quantities of grapes; otherwise inflammation of the mucous membrane may set in, and the teeth may be injured. The length of the cure is from four to six weeks. The most popular resorts for the grape cures are Meran and Montreux and several other places on the Lake of Geneva, both on the Swiss and the Savoy shores of the lake.

Nitrogen and Potash Interact

THE FORM OF NITROGEN was found to be of great importance for plant growth, as several recent references in our magazine have shown. These studies were made by Vickery, Pucher, Wakeman, and Leavenworth in this country and by Vladimirov in Russia. A very fine confirmation comes now in the case of corn from the Experiment Stations of W. Va. and N. C., published in the February number of the *Journal of the American Society of Agronomy*. It also shows that commercial fertilizers may quite severely affect the quality of the crops and the mineral contents in them. Where ammonium sulfate was used, the leaves showed a smaller intake of potash. From a practical angle this is important: when a field is low in potash, which is often the case in regions of great rainfall or heavy cropping, a rich supply of nitrogen fertilizers may cause a potash deficiency, while soils of low nitrogen supply may produce poor crops if potash is heavily applied. Needless to say, where a balanced plant food in form of compost is used, neither danger exists.

Pasture Improvement by Earthworms

By SIR ALBERT HOWARD, C.I.E., M.A.

IN the *News Letter on Compost* No. 13, October 1945 a short account was printed of an investigation, to be carried out in New Zealand, of the effect of earthworms in increasing the fertility of hill country. Great improvements in hill pastures had been reported by a farmer at Raetihi, resulting in a doubling of the number of ewes which his land could support. A fuller account of the experiments with earthworms made by this New Zealand farmer, Mr. A. S. Ashmore, appeared last year in an Australian newspaper, the *Gippsland & Northern Co-Operator,* reprinted from the *New Zealand Journal of Agriculture* of July 1945.

Mr. Ashmore farms 864 acres of hill country where the sward consists mostly of dry danthonia and browntop with much moss, and the surface is dry and firm. The worm population is almost nil. But some eighteen to twenty years ago Mr. Ashmore noticed a green patch in his orchard which stood out in striking contrast to the typical dry herbage which surrounded it. Each year this patch increased and extended until it went beyond the orchard on to an adjoining hill paddock. Here an earlier growth was noticeable and the sward was greener and more vigorous. Strong fresh browntop with rye grass and clover appeared in place of the old harsh dry danthonia and browntop, and moss. A more intimate inspection revealed that the soil here was spongy and moist. Moreover it contained large numbers of a small light-coloured worm, whose casts covered the surface throughout the winter and spring.

The changes wrought by these lowly creatures and the speed with which they spread made a deep impression on Mr. Ashmore. He began to collect the worms and to introduce them into other portions of the land. Later he practised an 'inoculation' of different areas by taking out small sods containing the worms and placing them in selected places on his farm. This work was most successful when carried out between June and October when the worms were most active. At first the sods were selected simply from areas which showed numerous worm casts, but observations soon indicated a difference in the value of various species of earthworm. Certain kinds thrived and multiplied much more rapidly, and so by their quick increase and numerous casts were better fitted for the soil-conditioning work Mr. Ashmore expected of them. Two or three years were needed for the worms to become well established. Thereafter they began to work out in all directions.

For the last fifteen years a systematic planting of paddocks with sods containing worms has been practised. By 1945 about 700 acres had been so treated and the good work of Mr. Ashmore's vast unpaid labour force in arresting deterioration of the pastures and improving their stock-carrying capacity was evident. The number of breeding ewes has been doubled: the wool clip has increased from 10,000 lb. in 1930 to 14,560 lb. in 1943-44.

In 1930 officers of the New Zealand Department of Agriculture became interested in this pioneering method of land reclamation. A specimen of the species of earthworm considered by Mr. Ashmore to be most effective was identified by Sir W. B. Benham of Dunedin as *Allolobophora jasseyensis,* a species common in southeastern Europe, but little known in New Zealand. How it reached the southern hemisphere and the Raetihi farm is not known. It seems, however, that it

does not require the special conditions appreciated by many other varieties of earthworm such as an abundant supply of humus or leaf mould. It does not mind poor pasture and high rainfall; it does not mind whether the soil be shallow or deep.

An official trial was started at Raetihi in 1941 on a hill slope not so far invaded by worms. Single sods containing the worms were planted in a line about one chain apart for a distance of several chains. By the spring of 1944 the worms had worked both up and down the slope for a distance of 1½ to 2 chains from the line of planting. Several acres already showed the effect of their dense castings in improved colour and vigour of the sward.

Promising results have been reported from other hill country farms which have obtained specimens of the worms and established them in their pastures; but much useful study may yet be expended on these lowly soil conditioners provided by Nature for the good of mankind. Darwin's great work in this direction has lain too long in oblivion. The re-issue of his classic on the earthworm (*Darwin on Humus and the Earthworm* with an introduction by Sir Albert Howard. Faber & Faber, London, 1945.) is timely, and the more the attention given in future to the role of the earthworm, the sooner will the war in the soil be decided in favour of organic farming and gardening and the day of the chemical fertilizer, which destroys or drives away this humble assistant of the cultivator, will be over. America and New Zealand have taken a lead in this investigation. It is up to the land of Darwin's birth not to lag behind, but to discover and reveal the full significance in agriculture of the observations of her greatest naturalist.

No White Bread For Britain

SIR ALBERT HOWARD sent us an issue of the *Parliamentary Debates* in the British House of Lords. Lord Hankey said on October 24, 1945 that after the introduction of white bread at the end of the last century, anaemia increased, teeth began to decay rapidly, and digestive troubles became more frequent. Now England will discard only 15 per cent of the grain, a matter that never seems to please the millers and vitamin manufacturers, but which pleased the Lords and the medical profession. Fortunately, we in America can get whole grain flour, which includes the valuable wheat germ, and the success of such bakeries as the Pepperidge Farm shows that more and more people want solid bread, that the white bread, which a bagging firm advertised some months ago as typically American, is no longer considered good enough, even if it is re-enforced by vitamins. Those who know the nutty flavor of good whole-grain bread, slowly milled on stone mills, will never return to the pasty airy loaves. For even though the price may be higher for full grain bread, it brings you a better bread. You pay less for your health when eating the whole kernel than when eating a bleached flour and a few synthetic vitamins.

In Defense and Favor of Foundation Plantings

By PAUL PFUND

IN his thought provocating article "*Foundation Plantings—Giving the Nurseryman Ideas*"?, in the January issue, Dr. Meyer ably offers a constructive challenge which I think could be profitably discussed. I would like to present for our consideration some of the whys and wherefores of foundation plantings based upon my personal experience and observations in landscape designing and planting of thousands of homes from the humble to the highly ornate, under most every conceivable condition of soil and environment, over a period of more than thirty-five years mainly in the city of Chicago and its environs including the countryside. We have here quite a variety of soils and varied contours and our climatic conditions include some of the most rigorous of any to be found. Through these years has come a rich experience and a familiarity with a wide range of ornamental and fruiting trees and shrubs as well as perennials grown in our nurseries primarily for our landscaping operations.

Dr. Meyer has interestingly invited us to go with him through a typical neighborhood of average small homes in a closely built section, where as he says we might even enjoy the fragrance of breakfast sausages frying. I recently had an experience in this respect. Instead of sausages however, it was topnotch steak with the proverbial onions, and this took place just before lunch time. Believe me I was ready to head for a good meal. Now, while such fragrances are really enjoyable, there are times when the wind wafts odors not so agreeable and when we would rather use a clothespin on our nose, as for instance when a neighbor decides to burn his old hot-water bottle in an alley bonfire on a Saturday afternoon about the time you are ready to serve barbecue sandwiches to your best friends in your lovely secluded rear lawn. These are of course extremities but are nevertheless experiences of those who either choose to or must live in such environments, and I think I know many of the good reasons for so living. I find just as noble and lofty minded souls there as anywhere else. As for me, I have perhaps an obsession for the more open spaces.

Now, as we view these lovely homes with their foundation plantings let us seriously consider why this is so. In the first place there is not space enough on the average city lot to effectively create outer border plantings in any great measure with plant material which lends itself to the best informal effects. Only in exceptional cases would outer border plantings be really effective in front lawn areas less than one hundred feet in depth. Secondly; a closeup view of a house without foundation planting is rarely attractive. The lines are too hard and cold, but place any house at a suitable distance from the road and you may lend enchantment to the view even without foundation planting if the surrounding areas are properly treated with trees, shrubs and flowers. The view from the house could and should be equally attractive under such environments.

Thirdly; in the case of a house on the corner of an intersection, outer-border planting is not feasable because growth of four feet or over, in height, would interfere with a clear vision for car drivers. This factor was recognized many years ago at least in Chicago and suburbs when city

ROSE GARDEN AND MUHLENBERG COLLEGE, Allentown, Pa. By Edgar T. Clewell

A successful combination of yard and foundation plantings. The flowering shrubs envelop the house in a shower of blossoms and fragrance.

ordinances were passed to regulate the type of plantings especially on parkways.

There is another reason for foundation plantings, namely, the spaces beneath the eaves of a house seldom permit satisfactory growth of but very few kinds of small plants, primarily because of the lack of dew. Consequently the result in an unattractive barren area where there should be luxuriant growth of lawn grass at least. Such spaces can be effectively hidden with suitable varieties of shrubs or evergreens set at a proper distance from the house line to avoid the harmful effects of the eaves. These in turn may be bordered with beautiful flowering plants if so desired.

We find then in the last analysis that foundation plantings around city homes are perhaps really not so much a choice as a necessity, and now, let us consider the planting treatment of the other areas making up the average small home grounds. It is truly remarkable how much can be accomplished in a so-called yard planting, on the sides and in the rear of the house. It is a fascinating study and offers a wide variety of choices taken the country over.

The final results in growth and effectiveness in any planting depend upon several pertinent factors. First, the soil must be of proper quality. This of course is brought about and maintained in a strictly true sense only by the liberal use of organics and natural minerals together with proper tilth, which we find in some of our heavier soil may well include the addition of sharp sand, rendering the earth more friable and therefore more easily worked. The fact that topsoil may be found mixed with clay does not necessarily render it unsuitable for plant growth. The addition of certain types of clay to some types of top-soil actually improves them. There are specific reasons for this. Next in importance, would be the selection of the right kind of plant material for a given area. Size of plants to begin with is of relative unimportance unless immediate effects are highly desirable. Selection should also be made with due regard for existing plant material or any that may be planted later. This is especially important in respect to large trees. There is also a condition that might be called incompatability among plants, and that explains in part at least, why satisfactory results are not always realized. Then too, there are plants which thrive only in shade and others that grow only in the sun, and still others that like half shade and half sun. All these make a very interesting combination in variation of foliage, bloom, height of growth, and seasons of maximum effectiveness.

For the shady side of a house we in this latitude (42) find such shrubs as Forsythia (Golden bell), Viburnum Opulus and Americanum (Highbush Cranberry), Hydrangea Arborescens (Hills of Snow), and H. Grandiflorus paniculata among others, do very well unless planted under large trees. All of these except the hydrangea also do well south of a house if not planted under large trees. The Hydrangea however will do splendidly out in the open away from buildings and trees in rich earth. For the south of the house and depending upon the height desired, Lilacs in variety, Philadelphus (Mock Orange) in assortment and any of the Spireas are dependable. Lilacs will rarely do well under large trees and north of and adjacent to buildings. This does not take into account several excellent small growing so-called ground cover plants. This matter deserves careful study and would fully justify separate treatment. One thing we should remember, there are finally no iron clad rules but rather definite principles to be observed.

We are now invited for a drive out into the wider spaces. Here as you already know is where I breathe easier but in leaving our nicely planted small city homes, let me say to the credit of their owners, I think their

accomplishments are truly quite wonderful, for very, very many of their plantings are indeed attractive, and as a whole do greatly stimulate the desire for civic beauty and perhaps portray the very essence of unselfishness because the neighbors and passersby receive as much enjoyment and inspiration as the owners themselves. Then too there are the Landscape designers and planters who also deserve much credit for their painstaking efforts in wrestling with the practical problems presented in the planting operations. In many instances these are very trying.

Ah yes, and now we find ourselves in a community of spacious grounds or perchance out in the country. What vistas, or opportunities for lovely views, we find; and so, if we are planning a home here, we should first of all consult the most capable landscape designer and planter available in your immediate neighborhood if possible, for it is he who should have the training to most advantageously help you decide upon a location for the house of your dreams, taking into consideration the contour, choice of exposure and by all means the most attractive natural vistas and established plantings if any, and all other possible comparatively important factors. By so doing much unnecessary later expense can often be avoided. Valuable existing growth can often be spared to greatly enhance the future harmony of the general landscape.

Here indeed we may give special heed to artistic and harmonious border plantings to be forever a delight to the eye and an inspiration to the soul. If material for planting is carefully chosen it will result in ever increasing beauty through the years.

So now I'll leave you with your favorite landscape artist, and when it may be my good pleasure to meet you again, you may be the happy and contented occupant of the home you have always hoped for, with a charming "border planting".

Garden Planning

THOSE WHO ARE interested in questions of garden planning will find an intelligent guide in the book by the well-known architects Ortloff and Raymore, *Garden Planning and Building,* New Edition, Garden Guild of America, 1945. This book is full of splendid suggestions, good specifications, and sound advice. It is the garden book in good taste, written for the modern planner. While plants are not much discussed, since they will be treated in a separate volume, the plans are excellent and should not only benefit the few who are planning to set up a large estate, but the many who are about to build a little house. The $2.75 they spend on this book can be amply saved by following some of its good advice in planning. It is a practical book full of valuable experiences which he who does his own gardening may well heed. Besides, it is clever, well written, and shows that the authors have a mind worth knowing.

Interesting Letters Department

THE writer has grown Dahlias on the same ground for the past fifteen years and each year they seem to be better than the one preceding. This is all because we always put back into the soil the elements that the Dahlias remove. Growing the same crop on the same ground year after year is contrary to what we have been told and seen in print, however we have proven that it can be done if correct methods are followed. We use all the dahlia stalks, dead blooms and old roots in our compost pile and they all go back for more food year after year. Our compost piles are composed of all the early weeds, all the trimmings of the dahlias, a quantity of straw from the chicken pens with the droppings, several yards of fresh manure, kitchen refuse, without the fats or grease, mixed with nearly an equal amount of good earth.

Our ground has not been plowed since 1930 and it is in wonderful workable condition. We use a Rototiller entirely thus saving all the humus and compost for the top six or eight inches, not turning up the subsoil as is done with the regular plow. Dahlia roots run lateral and if planted six inches deep they will be completely encased in the good rich humus of the compost material. Of course we get weeds, plenty of them, but they are easy to remove and after the Dahlias are up about 12 to 15 inches we weed them clean and all these weeds are taken to the compost pile and fresh compost is brought in and the Dahlias get a good mulching of this material which keeps the weeds well under control and saves a great deal of cultivating. We find that two cultivations are usually enough for the entire season where we use a compost mulch. About every three years we cover the ground with several inches of straw and have it Rototilled into the top six inches two or three months before planting and we find this to be a big help. When we dig our dahlias in the late fall the soil is readily knocked from the clumps even if quite wet. This is quite different than it was several years ago before we started using so much compost, for the soil was heavy and had to be washed from the clumps.

We have visited Dahlia plantings that were being sprayed at least once a week for plant lice and then the ground was caked as hard as a board walk and the dahlias had a hard struggle to get along. These plantings were watered twice or three times as much as ours, while ours were free from plant lice and the soil always in pliable condition. We have a good sprayer that is passing away from lack of use. Our Dahlias have not been sprayed but twice in the past five years, and then with a light solution of Rotenone.

When Dahlias are grown in soil well filled with compost from their own stalks, flowers, etc., along with the other material that makes a good compost one need not fear insects or disease from using the same soil year after year.

J. E. Hulin, Seattle, Wash.

BLUEBERRIES

Dear Sir:

I have become quite enthused over Organic Gardening, having made four large heaps this year. The two first heaps were too late for use this year. I used partially finished compost on

turnips and wax beans, late planting. The beans were fine and we never had turnips grow as these did. I am hoping to use a lot of it next year.

I have had wonderful success with blueberries. I put a mulch of sawdust all over the ground in my patch. It is about 6 inches thick. Mine have grown much better than any I have seen elsewhere.

Ernest M. Watson,
Chardon, Ohio.

MANY WRITE LIKE THIS

In last December's "Reader's Digest", there is a condensed article from "The Saturday Evening Post" about our mineral depleted land entitled "Are We Starving To Death?" This story is ending with the advice that chemicals are the answer for soil-restoring and our war-expanded chemical industry will find a great peacetime opportunity. Who is right, good old Mother Nature, or laboratory Science with its advantages and disadvantages?

At any rate, after reading your booklet "Are Chemical Fertilizers Ruining Our Soil And Our Health"? which you sent to me just recently, I admit it sounds even better. As a native of Switzerland I also or still believe in sticking as close to Nature as possible without going wrong. 35-40 years ago when I was a boy over there I never heard of *commercial fertilizers, but you should see those rich vegetable gardens, fruit orchards and wine cultivation to say nothing of the innumerous enchanting flowers.*

Moreover, the alpine pastures rich in organic deposits with an abundance of mulch in winter, rain and sunshine during the other seasons bring forth the lucious grass, medicinal herbs and millions of wild flowers, transforming every meadow into a riot of colors from early spring until late fall. Result: the cows grazing in these pastures produce a rich butter fat milk which in turn becomes the world famous Swiss cheese and the equally famous rich creamy Swiss Milk Chocolate without that ultra sweet SUGAR taste of our candy here. These are untarnished facts as I know them from actual experiences on both sides of the ocean.

B. S., Chicago, Ill.

GRASS THE POET

Each grass blade that matures and dies
Dampened by moisture from the skies
Increases by it's own small worth
The richness of immortal Earth.

James V. Solberg

EXPERIMENTS

After reading articles in your magazine, "Organic Gardening," with great interest I decided to experiment and thought you might be interested in the results.

We have what is considered an unusually good garden patch, well drained, light loamy soil, fine exposure. It produces fair crops but we have been severely troubled by insect pests and have been compelled to spray continuously and thoroughly.

Extending through the grounds is a ravine with several small areas of river flat left virgin for many years, rich in humus and earthworms of great size. We had the stream channel dug in order to drain these areas then made small trial gardens. The tomato plants, cabbage, corn, broccoli and melons that were planted had a luxurious growth and produced excellent crops of fruit and vegetables. We also had a riotous growth of beautiful flowers and gourds of enormous size both of which took prizes at a local festival. But the remarkable point is that no spraying was necessary and there was no evidence of insect pests whatever although the area is quite close to the regular garden patch.

This convinces me of the necessity of renewing the organic content of the soil and the value of the many expositions that I have read in your excellent publications.

Miss Ada Whitworth,
Cleveland, Ohio.

Gladiolus PICARDY W. A. Burpee

Old Fashioned Flowers

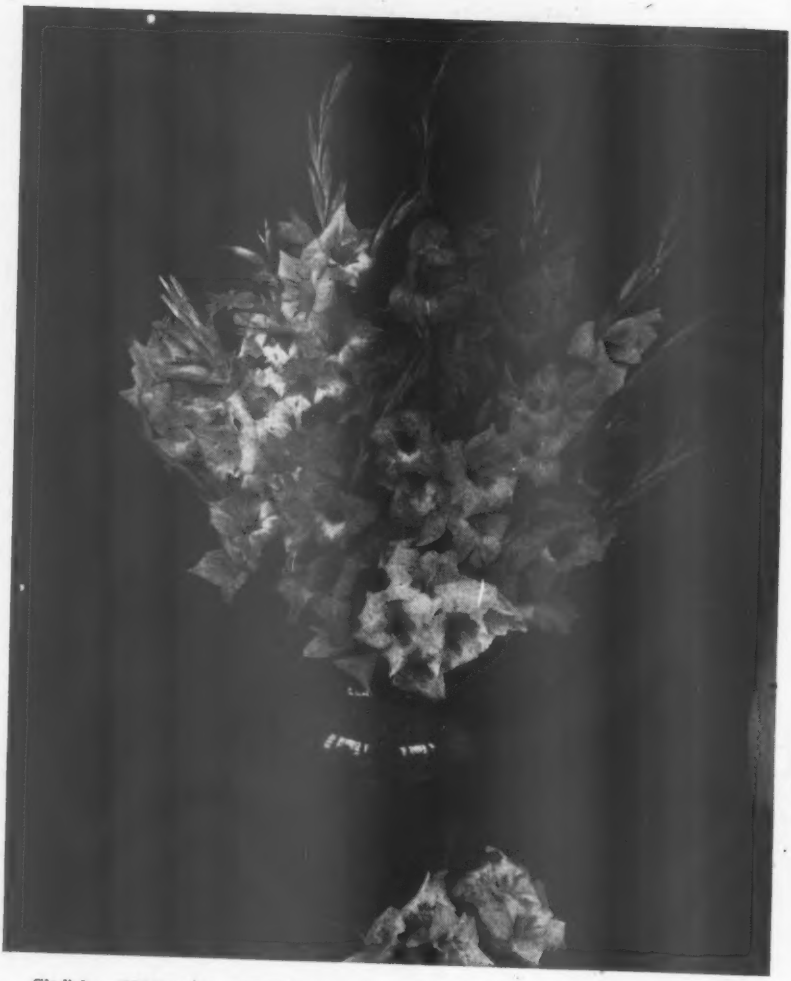
By DORIS CLARK

GLADIOLUS

BUT glads are not oldfashioned! As a matter of fact, Dioscorides whom Mr. Barlow so frequently mentioned among his herb specialists, refers to them about 1800 years ago. But they became well known to the gardening world only in the nineteenth century. McFarland, Hatton, and Foley say in their amiable and useful book, *Garden Bulbs in Color,* (Macmillan), that 1856 was the decisive year. Queen Victoria visited Paris at that time and gladiolus exhibits were made and appreciated to such an extent that since then the flower can be definitely called popular.

While ordinarily we like to show the botanical classifications of our flowers, so that the gardener can see them in relation to related plants, we cannot do so very well with gladiolus, because by now only hybrids are available. *Gladiolus* means *little sword,* referring, of course, to the leaf blades; no wonder if the flower was formerly called *Sword Lily,* though the common sword lily of Europe is the *Lilium aurantiacum* or *Lilium croceum.* But just the same, botanists classify glads among the Irises, not among the lilies. Close relations are Montbretia or Tritonia, Freesia, Watsonia, and others which we mainly grow and force during the wintery season.

All of them have in common a Southern origin and all of them are therefore summer plants or forcing plants, not hardy. Our present gladi-



Gladiolus, FORDHOOK HYBRIDS

W. Atlee Burpee

olus stock is grown in the warmer parts of the country, in Florida, California, and the Gulf Coast States. And all of them should be placed out only after the weather has become settled and danger of frost is passed.

The soil they need for good flowering should not be too rich, because rich soils produce much vegetative growth while reducing, at the same time, the number of flowers on a spike. A good flower, to be cut for the vase or to be enjoyed in the open, is one that has a long spike with many flowers opening about the same time. This is one of the major aims of the breeders. If the soil is rich in phosphorus, as a result of an application of ground phosphate rock or colloidal phosphate, better flowering may be expected.

Gladiolus writing is centralized around the Gladiolus Society which has established a practical classification and a list of favorite varieties. But more essential than color blends and shapes of blossoms is, at least for the average gardener, the date of blossoming. Glads are, like most bulbous plants, in need of a winter rest at lowered temperature. In the South, this rest must be secured by cold storage; in the North you may keep the corms in a house above freezing temperature. It has been said that the temperature should not be above 50°, because the corms might otherwise dry out. I have kept them safely in a room that was warm in daytime and cold, but above freezing, at night, and never had any adverse effects from this treatment. But—to repeat—putting out glads is definitely a matter of summer temperatures. There is no sense in placing a hot weather plant in a cold soil. The corm will not send forth any shoots until the weather has reached a balanced, settled warmth similar to the one under which gladiolus originally developed.

While tulips, narcissi, and many other bulbous plants look best if set out in groups of one color, gladiolus, I think, makes a better show when all colors are mixed. You could make formal gladiolus beds by contrasting whites and purples, reds and yellows, lavenders and oranges, but the stiffness of the growth wars against additional formality. Glads are formal enough by their growth habit without selection of colors practiced by the rigorous gardener. The riot of various colors, whites and lavender, scarlet and maroon, deep purple and soft lilac, salmon and mixed shades, produces a healthy variety to offset the stiffness of the growth.

For a harmonizing principle, for a unity in all this diversity, I prefer to rely on another flower, the Montbretia, which with its golden brown flames on slenderer spikes really sets off the lighter and richer colors and shades of gladiolus, one supporting the other, one complementing the other, one emphasizing the other.

Gladiolus may also be planted between annuals and perennials if you want an oldfashioned farm type flower bed. A few poppies, a few of the beautiful balsams, a few pinks, a few larkspurs, all rich-colored bloomers waving their spikes or heads between the more rigid glads—this is a picture which, by no means, is unattractive. Or, you may intersperse glads with other bulbs, especially if the glads were chosen for a long blooming season. The lilies and day lilies will precede, accompany, and follow their flowers.

Everybody knows that gladiolus is a splendid cut flower. A tall crystal vase filled with a variety of spikes, a few montbretia flowers between, can make a room more festive than any other arrangement. For gladiolus, the Sword Flower, is a flower of stateliness. It is a cool and distinguished, indeed, an aristocratic flower. But only in appearance. As far as growing is concerned, no trouble can arise. Everyone can grow them almost anywhere. When you purchase your bulbs, take care that you get a sufficient number of the blue varieties, the purplish hues, the dark reds, and a

few of the yellow ones, between the more common pinks and rose shades that predominate in collections. A good policy for a start is to order a collection and to add a few of the finer varieties. Just do not miss out on the white ones. They really help in setting off all the others.

All the growers offer more expensive varieties of mixed colors, pastel shades, and jumbo sizes. Some growers also have small bulbs for sale which may or may not bloom the first year, but which will grow to average sizes during their first year of growth. When frost begins to menace, you dig up the increased corms or, as they are commonly called, bulbs and the small bulblets that will have formed around them, to increase the display the year afterward. Do not water the bulbs during the winter, for they do not require any outside moisture during their period of winter rest. They did not have it in South Africa where they originated. And next year you will have again a bed of rich and varied colors from July to September.

Garden Calendar --- April

North Temperate Zone: The time for planting and working in the garden! Peas, spinach, Swiss Chard, beets, radish, lettuce, celeriac, celery, salsify, carrots, parsley, leek, onion sets, onion seed, parsnip, etc. go into the beds. By the middle of the month, weather permitting, you can set out the hardier plants of the cabbage family, unless you have decided to grow them from seed on the spot and to thin them. This is often the safest method of getting good crops, because the plants grown on the spot are not attacked by insects and cutworms as are those which have been transplanted.

Most annuals and perennials can be put out. The old beds can be topdressed with compost or bone meal or both. The shrubs and trees should not be pruned, but grafting can be done now. Espaliers should be protected against sun, and roses, now freed from the mulches, must be watched against sun scald. It is best to open the mounds and mulches little by little. Shrubs and trees can be treated with liquid manure.

Toward the end of the period potatoes are laid out. You need *not* cut the seeds. If you use compost, do not apply any lime, because potatoes like an acid soil.

Try upland cress instead of the curly cress. It is longer-lasting and finer of taste—wonderful for bread and butter sandwiches, salads, and with sliced tomatoes! A wet spot suits this cress. If you want asparagus, now's the time to start a bed.

Southern Garden: Corn and the Vine Crops go in. Beans, tomatoes as well as peppers and eggplants, okra and cantaloupes are sown or planted in April. The same holds true for the California garden.

Old Rule: A good cherry bloom announces also good grapes and grain.

The Place of the Earth In the Compost Heap

By OLIVER LAWRENCE

"I cannot get earth for a compost heap" is a familiar plaint, coming especially from those with small gardens near large cities. Having been similarly handicapped a few years back, the writer can readily appreciate their dilemma. Unlike our country cousins with large areas of farmland from which to borrow earth—subsequently returned in compost, with rich dividends—a suburbanite must seek earth from some excavated site for new dwellings, or buy top-soil from a nurseryman in the community, or take a few gunny sacks and a shovel along in his car on a weekend picnic to the country. (Note: Get landowner's permission, and don't take more than four or five inches of earth from any one spot in the woods). Silt from ponds, streams and ditches, soil from new roads and paths (replaceable with coal ashes and stones), hills to be graded, and unplanted spaces in front of buildings, all provide additional sources that farmers may tap in seeking earth for compost heaps.

Mud from ponds, lakes, or streams (if not chemically contaminated) should be spread out for aeration in flat heaps not over six or seven inches in height, with straw, hay and leaves mixed in to break it up, before using in the compost material. Add plenty of ground limestone, Dolomite, or wood ashes, as the mud will be quite acid. It would be a mistake to directly apply this mud to the land as this would cause the same trouble usually experienced when raw manure is incorporated in the land or a green manure cover crop is plowed under.

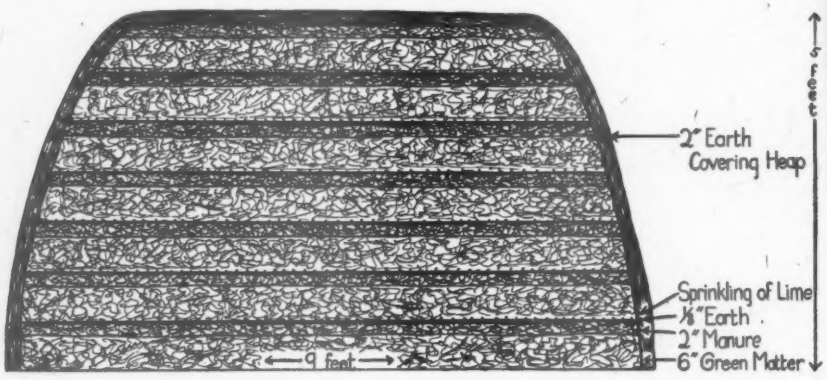
The overflow from the Nile River in Egypt contains a fine sediment that makes unnecessary the application of other fertilizers. The Chinese have been adept in utilizing the sediment of streams, but include it in compost heaps instead of directly adding such sediment to the land. River bottoms and washed down soil from floods and overflows provide excellent composting material. Recently one of our subscribers related how he rigs up some big log booms along a river bank and accumulates good earth and other material for his compost heaps. In another instance, we heard of a farmer using the cleaned out sediment from a mill race, but he made the mistake of immediately applying it to the land instead of first aerating and then composting this sediment. That year his crops derived no benefit; in fact, they were retarded because of the absence of available nitrogen, but in the following year the activation by beneficial bacteria, earthworms and other organisms in the soil had made available the nutrients needed by the plants. While plants rely on earth for but a relatively small proportion of their food, the bulk of what they need coming from air, rain, and other influences of climate, the more fertile the soil the more tolerant will be the land to cover crops plowed under. Bacteria need nitrogen as growth food in breaking down the plant material, so if the land be fertile (and especially if compost be plowed under with the cover crop) the extra nitrogen will be present.

Earth comprises but about five per cent of the bulk of a compost heap; but here, as in many things in life, quality and utility outrank quantity. In successive layers in the compost heap appear six inches of plant material, two inches of manure, and one-eighth of an inch (just a mistlike sprinkling, to which compost is a valuable amendment as an activator) of earth (with a touch of lime), until a five foot height is attained, when a two inch blanket of earth covers

everything. The earth is the meeting place of physical, chemical and biological activity—where mineral, vegetable and animal kingdoms mingle and react one upon another. About one-half of earth is porous space filled with air and water—but its importance to plants is as the heart to the human body.

In the compost heap never use earth that has been dosed with chemical fertilizers or chemical sprays, for chemicals inhibit the micro-biological life that we should try to encourage. One of our readers thought that he had the answer to his problem of getting earth for his compost heap when he took some soil that had been removed from the greenhouses of a large commercial nursery. To his sorrow, he later on discovered that chemical processing, fumigation, etc., to prevent "damping off," insects, and diseases from injuring seedlings in the greenhouse had killed the helpful bacteria —and "life" was no longer present in this soil.

Acting in affinity with lime, earth's principal role in the compost heap is to neutralize the acid forming tedencies induced by fermentation and decomposition processes as plant material and manure are broken down by bacteria and fungi. While a relatively small quantity of bacteria from the earth contribute to this work, most of the unpaid labor army of bacteria are recruited from the manure in the compost heap. It has been estimated that about 25% of the material in fresh manure are bacteria. In the compost heap a metabolism of some sort goes on, with earth and lime establishing the proper controls, checks and balances, so that the finished product, compost, is a sweet-smelling, well-balanced fertilizer. When a dearth of soil exists, go a little heavier with the lime in a compost heap. A rather common error on the part of many of those making compost for the first time, or who have been mak-



ing it in a hap-hazard fashion, is to incorporate too much earth in the heap. Too much earth impedes aeration and this, in turn, curtails proper heating and retards the various chemical changes that occur in the making of compost. Not enough earth in the heap prevents proper neutralization of the acids. Never use earth that is too wet to plow, as this would clod up instead of granulating into the more desirable fine particles.

Wintertime composting presents a difficult problem in the Northeastern and Mid-western States due to the frozen condition of the land, making unavailable earth for the compost heap. If you plan to compost during cold weather, store away free from the danger of frost whatever earth

will be needed. A corner of a barn or cellar, or a pit (like that which is used for storing root crops) dug below the frost line and walled in with straw, might be utilized. Mix some straw or hay with the earth and cover the heap of earth with a thick layer of straw, to lessen the danger of freezing. If no earth has been saved and you have a lot of manure, leaves and other materials ready for composting in the Wintertime, extra quantities of lime must be used in the inside sandwich layers of the heap and the outside blanket normally of earth should be of at least two feet of straw. Any type of earth excepting sterile sand may be used in a compost heap, but the more "life" or bacterial activity present, the better.

For alkali soils, typical of certain Western irrigation areas, lime and wood-ashes must be omitted from the compost heap, as these would only increase alkalinity. Leaves and earth from woodland (generally rather acid, depending on plant varieties) should be added to compost heaps intended for alkali lands. We do not subscribe to the use of chemicals such as sulphur, gypsum, epsom salts, magnesium sulphate and aluminum sulphate, to bring about an acid reaction in alkali soils. Irrigation furthers alkalinity, partly from the upward movement of salts with capillary water and partly from the alkalinity of some of the water itself that is employed in irrigating the land. Our approach to the problem is to improve the buffering structure of the soil with compost featuring an acid reaction, or resting (fallowing, but not a bare fallow) the land for a year or more. In reclaiming alkali soils, the products of the reaction between the agency employed (compost) and the alkali finally are removed by leaching and erosion with irrigated water.

Sir Albert Howard's formula of certain proportions of vegetable and animal wastes, with earth to neutralize acidity, comes from Mother Nature herself. Over a period of a great many years of observation and experimentation, Albert Howard observed the relationship and admixture of plants and animals, and the carbon-nitrogen ratio, out of which in the composting system he evolved comes a natural and soothing means of restoring to the land that which had been taken away. In the laws of Nature, one has something dependable to deal with.

Dr. Hugh Bennett, on African Compost

DR HUGH BENNETT, Chief of Soil Conservation Service of the U. S. Dept. of Agriculture, on a visit to South Africa a few months ago said, in a radio broadcast there:

"And the splendid results being obtained from compost are most encouraging. The returns are entirely too good and too practical to be dismissed as merely an item of the normal mechanics of farming."

He was, of course, referring to the way the making of organic compost by farmers is taking hold in South Africa.

Lawns

By HEINRICH MEYER

SINCE all kinds of grasses grow wild everywhere on earth and in all grades of climate, it would seem that making a lawn is an easy thing. Since lawns have been made for over two centuries, at least, it would seem that nobody could add any information on the matter or express an original idea. Yet, it is well known that books on lawn care appear regularly and that the art of making a springy turf is never at a standstill. One firm even puts out a periodical on lawn-growing. Nor are lawn making and lawn care so simple. No wonder that more men and women take pride in lawns than in anything else they grow. No wonder that more people raise lawns than flowers and vegetables together.

Before we enter upon cultural details, let us keep three fundamentals in mind:

1. Lawns are a cultivated crop. Lawns are an artificial enterprise that has no counterpart anywhere in nature.
2. Lawns owe their quality to vegetative rather than sexual reproduction.
3. Lawns must stay put, while grasses in nature can migrate.

Rarely do gardeners and house owners stop to think what makes a lawn such a unique enterprise and rarely do they therefore reap the rewards for their efforts and expenditures; for, let that be understood, there is no costlier crop than a lawn. It produces neither food nor flowers, but it must be watered and mowed, it must be trimmed and fertilized like no other crop.

Under natural conditions, grasses grow and form meadows and mats and carpets. These grasses are interspersed with different plant species, so that to each plant of grass a relatively large territory is allotted. Here, the various plants, including the grasses, attain flowers and produce seeds. These seeds propagate the species in question while, at the same time, a moderate amount of a-sexual expansion takes place through runners which set up new plants with flowers and seeds. The residues from these plants stay on the spot and produce a natural fertilizer. But if the soil should gradually change, the grasses can move on and find unexplored and undepleted land. For their seeds spread and their runners run. Yet, all these natural processes must *not* take place in a *lawn*.

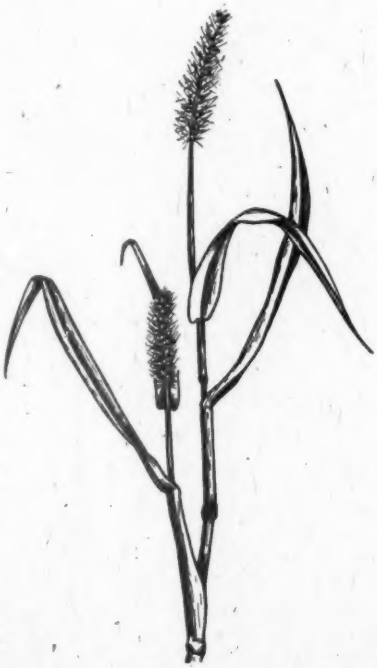
Here we want a dense mat of grasses only, possibly with a slight admixture of clovers. We cannot allot much space to the individual plant, because we want a dense stand. It can immediately be seen that this in turn determines the need for watering and fertilization. For while the dense stand shades the soil and checks evaporation, the number of plants to be lushly supported (on a relatively small space for each individual) requires topmost fertility and, under average conditions, additional watering.

We cannot permit lawn grasses to go to seed because we are not interested in grass flowers, beautiful and interesting and variable though these may be; we want the utmost of vegetative growth. It is well known to thoughtful plant physiologists that there is a constant conflict between vegetative and reproductive processes. If you allow a plant to go to seed, if you permit another

generation to develop, the mother plant may have completed all or part of its job. It will cease growing, it may even die. If you prevent it from flowering and seeding by constant cutting or mowing, you force the plant individual to spread itself, as if it had the secret idea of an escape. It will send out shoots and runners, it will expand itself by vegetative regeneration. True enough, these offsets are part of the same plant, even if ultimately they cease to be connected with the mother stock; but the new plants to all intents are complete and *could* reproduce themselves. But we will oppose this most eminent urge, because *we* want a lawn.

Everyone who has a big lawn knows of the task that trimming the edges may involve. And if he does not do the tedious job himself, he knows of the time it takes when he pays the bill. Let us look at this bill from a botanical angle! The grasses merely follow the natural urge that has made them the most common plant on earth, they follow their migratory need. They want to escape competition with other grasses and get to where the perennial border or the lusty beds of annuals seem to enjoy their territory so exclusively. This migratory habit of all suckering and tillering and layering and running plants—and most of them are, when given a chance—is very interesting. In a human we should call it zest for life.

In some of us, especially us moderns, the desire for self-expression and self-perpetuation and even security is greater than the urge to sexual reproduction and founding of new gen-



QUIZ—Are these Grasses lawn grasses? Answer will appear in next issue.

erations. Healthy persons usually combine the two tendencies in some mixture, though I suspect that the growing preoccupation with sex questions is partly due to the repression which the natural reproductive instincts have to suffer. In plants these two tendencies are also present, though in highly varied mixtures. Grasses are among the most reproductive plants, and at the same time, among the most boldly suckering and self-perpetuating beings. If given half a chance, they throw out runners —not to perpetuate the *kind,* but to perpetuate the *individual.* This fine habit helps them along. They can intrude quickly and then take over with persistency. But do we let them follow this ingrained urge? On the contrary, we trim the edges and force the lawn to stay put. Monoculture at its peak!

The main problem is the value of the seed. While Bermuda grass and Saint Augustine grass are usually planted, reproduced vegetatively as it were, the more Northern grasses are preferably sown. This can be done according to moisture conditions, either in spring or in late summer and early fall. You want to give the plants an early start so that they can survive the heat of the summer or the frosts of winter. Success depends almost entirely on climatic and soil conditions, but with watering and proper soil preparation success can be had. The seeds will germinate and grow. But grow into what?

Good lawns are always composed of several grasses with several growth rhythms. Thin-bladed ones and thicker-bladed ones, some which have their summer rest early, others which

QUIZ—Are these Grasses lawn grasses? Answer will appear in next issue.

postpone it. Some which grow fast, some which grow sparingly. The composite of these different species produces a lawn that is good at all times, especially if it is not clipped too low. (A low-cut lawn is easy to mow and therefore chosen wherever yardmen have the decision, but it is not a good lawn. A good lawn is deep.) This immediately shows a problem: Which grass varieties can be blended so that the density is good even as the different grasses grow at different rates and shade each other accordingly. This problem of ecology cannot be solved in a general way, since each region has found its practical solution and since the better seedsmen have from long years of practice arrived at sound mixtures.

The only exception to grass mixtures I know of as having practical significance are Bermuda, St. Augustin, and the now famous Flawn, which Woodruff introduced a number of years ago. Instead of seeking quick growing grasses, we must look for slow growers—this revolutionary idea brought about Flawn. But a good lawn cannot be achieved over night or even in one year. For a good lawn is one that will stay and live and stand the local climate.

The question whether the grass clippings should be collected or left on the ground will depend on circumstances. If they are collected they should be mixed with other green matter and composted so that they can be returned to the land as topdressing in future years. Naturally they contain the right mixtures of minerals and nutrients which make grass grow, since they are grass themselves. In a healthy lawn, they can be therefore digested in very short order, and more and more people have learned to leave them on the spot. I myself do not do so, partly because I don't like the sight of half-dried wads collecting after a rain, partly because I can put them into the compost and know that the material will ultimately come back to where it sprang from.

The question of watering is unsettled. It is a well known fact that grass grows successfully without watering, certain varieties more so than others, and that, once watering has started, it must be continued. If you leave a lawn unwatered, let it get slightly or even considerably burnt, you will, of course, have nothing to be proud of, but the grass survives it. If on the other hand, you train the grass to get going by giving it liberal sprinklings, then stop while you take your summer vacation in Estes Park, some of the grass will not survive and the lawn will look spotty. But when you water, soak. Sprinkling with a self-moving sprinkler is fun if you have children who want to play, but the canvas type hose that deeply soaks the soil is best. A few good soakings during a season are better than a daily sprinkling. But if you sprinkle, do it in the evening. You have more time then and can make it sink in deeper than if you do it between breakfast and going to the office.

And how about fertility? Compost does the job as nothing else. If you make compost *without* an addition of lime, it will be better for the majority of lawn grasses; they like a soil on the acid side. If you can save your leaves and compost them together with other materials, you can get a richer deep lawn soil; however, too much leaf mould is not desirable.

You have to add a nitrogenous fertilizer of one sort or another. If you can get manure for inclusion in the compost heap, then the results will be perfect. If you can get chicken manure, which can be applied in liquid form over the leaves and clippings etc., you will get the same results. If cottonseed meal ever gets released to the fertilizer trade, it is directly applicable to lawns; the smell of it is not as bad as that of fish meal, and the reaction is more on the desirable side of acidity. I personally prefer to make no direct applications of any fertilizers, but mix the material with weeds and leaves and other residues, and

then spread it thinly in late winter before the active growth starts. It is best to go easy on the nitrogen because you do not want a quick growth. Try to emphasize the potash part which is contained in the leaf mould and green matter of the compost, because these will give sturdy growth. Phosphorus is rarely needed. It stimulates flowering which you don't want.

Lime, too, is rarely necessary, often directly detrimental. Where moss has started, you cannot make the soil sweet with lime. In that case, new plant food has to be added and the soil prepared from the beginning. Unless, of course, as J. I. Rodale suggests half-humorously, you decide to grow moss *instead* of grass.

Preparing the ground for seeding is a matter that is simple if you disobey the standard prescription: Make a fine seed bed. I say (and I say it emphatically since speaking to our experienced contributor, Mr. Pfund): *Don't make a fine seed bed.* Leave it coarse. The rains and other factors will level out the bed and give you a much better lawn for this reason: The seeds *will germinate at different levels.* You get the effect of an old lawn much sooner if you grow grasses in different galleries rather than in one plane. But this question should be discussed in a later issue by Mr. Pfund who has made hundreds of successful lawns.

Hardening Off

WHEN YOU HAVE raised plants inside in a flat you have provided for them considerable protection. They were not exposed to the direct rays of the sun. They were not blasted by heavy winds or battered by downpours of water. All this happens to a plant under outside conditions. Thus it is only logical that plants grown in the open have developed greater hardiness than plants coming from the greenhouse or propagating flat. How can you make the transition easier?

The first thing comes with the warmer days of spring—you want to open the window to let fresh air in on your plants, at least during the warmer hours of the day. You want to let them have some direct sun light unbroken by window panes. Be careful not to overdo it. As the plants take on a more rugged appearance, you will stand them out-of-doors, but not in the direct sunlight. Let them get some sun, but keep them part of the day in a shaded spot. Then, after a week or so, you can transplant them into the open. So many people who buy greenhouse plants at the nursery stands fail to realize the importance of this procedure and their plants suffer such a check that they either become a total loss or do not make the expected growth. By hardening them off, you get the full benefit of your head start.

The Case of the Hop

By DR. EHRENFRIED PFEIFFER

NOT that I believe that you should start a hop garden, I am bringing the case of the hop before you simply because it is an outstanding example of a biological and organic principle. The hop is behaving naughtily in recent times: It grows taller and taller. Some 75 years ago, it is said, one could pick hops while standing on the ground, then one needed a step ladder, then a long double ladder and now they grow on 27 ft. high wire contraptions. When harvesting there is nothing left but to take down the whole works.

It was some twelve years ago when an Alsatian farmer complained to this writer about this case of the hop. He could not afford to buy a blimp or a helicopter with a platform underneath to pick his hops without tearing down the wire and pole construction which looked like an enlarged preview of a radar antenna. Studies and experiments were made which led to the result that three years later this same farmer harvested his hops from 12 ft. poles again. The sturdy vines yielded as much as previously the frail 27 ft. trailing vines and for the quality the farmer earned the nation's honor reward.

Evidently it was not bad will on the part of the hop that it grew "out of hand". It was mistreated and could not help it.

To introduce the culprit—the hop, with the latin name of *Humulus lupulus*, nearest cousin to the hemp, belongs to the family of the Cannabinaceae the hemp family. Its female flowers at maturing time have been used for the manufacture of beer since the crusades or, according to Linnaeus, since the European folk migrations. They have a peculiarly bitter and strong aroma that gives beer its characteristic flavor. They increase the keeping quality of beer and ale. The natural habitat of hop is in the wild woods, as a climbing vine on trees. It prefers deciduous trees, naturally. And it was there, certainly, that its properties were discovered and man was attracted by the peculiar aroma.

Once their virtues were appreciated the hop was taken out of the woods and planted in fields. Poles were substituted for trees. However, trees offer plenty of branches and twigs for a vine, which a pole does not, and therefore strings and wires took the place of branches.

In woods and thickets along rivers and streams the hop grows sheltered and as nourishment has the finest leafmold and humus there is. The atmosphere underneath trees is always a little higher in moisture and a little cooler than outside. Humus, and the protection and shade are what checks the growth of the hops under trees. All this is lacking in our open fields. I also imagine that probably all vines when taken away from the wood shelter lose something of their twining quality. They have to "stretch" on poles.

The change of biological conditions was accepted by the hop in the beginning and it even reacted favorably in certain cases, namely, if certain very specialized soils were offered:

Soils with a heavy clay layer on limestone. Plants in clay plus limestone have the natural tendency to grow slowly, to develop more breadth than height. Silica soils, on the contrary, stimulate more the growth into height, as physiological experiments have shown. Thus the hops selected for themselves conditions which helped to check excessive growth into height. One could almost say that their natural growth instinct searched for a substitute of forest conditions. I consider this change of habitat as one of the most interesting and instructive examples of adaptation in plant life.

Hop as a result, is traded in the Old World like wine, according to the place where it grew. It was known that hops from certain places in Alsace, Bohemia, Poland or Bavaria were excellent in quality. Also in this country we have preferences regarding certain locations in New York State or Oregon.

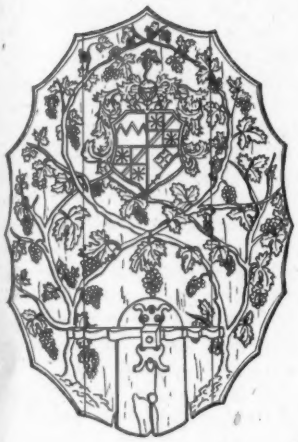
So far, so good. But now come our modern methods of producing and increasing crops: fertilizer and intensive tillage of the soil. Potassium and nitrogen fertilizer, the farmer was told, increase yields and push the plants ahead. They certainly did the trick with hop until it grew higher and taller, climbing as high as 27 ft. My Alsatian farmer friend was desperate when his ladders wouldn't do any more and he had to tear down his wires in order to harvest the blossoms. Actually in the case of the hops only the yield of the vines had increased, but the hop blossoms declined in flavor.

This growing taller and taller is an interesting symptom. It does not only occur in the plant realm, as has been demonstrated, but also in the human realm. The medical draft examinations have shown that the average height of man during this war was greater than it was during the last one. And our anthropologists have also reported for quite some time that the increase in height is a result of urbanisation. It is a typical symptom of the fact that growing organisms have been estranged from their original and natural environment.

The solution of the hop problem, however, is simple and can be told in a few words: Leaf compost and humus. These retain at least some of the natural properties. The former wood and thicket vine still prefers leaf humus and, since it cannot grow in the shelter of trees any more, it should have the roots and soil protected by means of mulching. Compost of leaves and mulching provide plenty of potassium in organic form, which is indeed what hop vines like. Two to four pounds of compost to each plant was about all that was needed in order to return the plants to a better, more aromatic yield and to practical size. Early vegetable crops can be grown as intercrops before the vines grow high enough to overshadow the space between the rows.

That reminds us, by the way, that the young hop sprouts, just coming out of the ground, make an excellent dish—hop sprout salad with vinegar or lemon juice and oil, like asparagus or bamboo sprouts. They have a spicy, stimulating and sophisticated taste. For such purpose hops could even be grown in every home garden.

French chefs, following the example of medieval monasteries, used to prepare "spring" soups and dishes with chervil. The idea was to use herbs and other plants which stimulate metabolism and the kidney functions in order to remove the deposits which had accumulated because of indoor life and insufficient exercise during the winter. Hop salad was one of these beloved "spring cures". Hop tea even was used in bygone times as diureticum, without the bad by-effect of excessive beer drinking on the liver. After all there is something in these old customs of eating and drinking and curing. It is only modern supercivilization that turns away from old wisdom and wants to have a chemical with an unpronounceable name in order to feel fine.



Hints for the Home Fruit Grower

THE GRAPE

By ROGER W. SMITH

EVEN though you have successfully grown flowers and vegetables you may have many misgivings when you start growing your own garden fruits. A venerable fruit tree can be awe-inspiring, a row of neglected grape vines picturesque; the ordinary gardener may quite easily be overwhelmed by the problems their care and culture involve.

Quite often the gardener starts growing his own fruit because the garden he took over contained a few forgotten currant bushes, an ancient apple tree, or a tangled fence-row of grape vines. The vines bear little fruit. They wander all over the place. How to get them under control? How to cause them to produce a heavy yield of health-giving fruit?

Your problem is not a simple one but you can simplify matter by determining just how much of the vine is actively alive. The old vine has a rather thick trunk, from this the bark is peeling in long dead strips. In a general way, much of the vine merely serves as a connecting link between the vine's two extremities, the roots and the growing tips of the widespread canes.

This is largely so because, in the wild, most grapevines have their roots in one place and their actively growing and fruiting parts far from their roots —often in tree tops. In many types of wild woods-grapes the vines literally runs a race with the tree upon which it climbs so as to keep its own "head" up in the sunshine.

The word "grape" is closely akin to "grapple" when used to indicate hooks. Wild grapes have long survived because of their ability to use their hooked tendrils to pull themselves out of unpleasant situations.

The root tips and root hairs are active. The long trunk, and much of the material forming the canes and branches, may be conveniently thought of as cables which connect the roots with the growing tip. The thin, green cambium layer which you will find beneath the shedding bark is a living film through which sap moves. Most of the attenuated vine is made up of relatively inert wood covered by a thin layer of this living substance. The living substance of a vine, no matter how tangled and extensive, is spread so thinly over the wood that it about equals the thickness of a layer of paint on a newly painted barn.

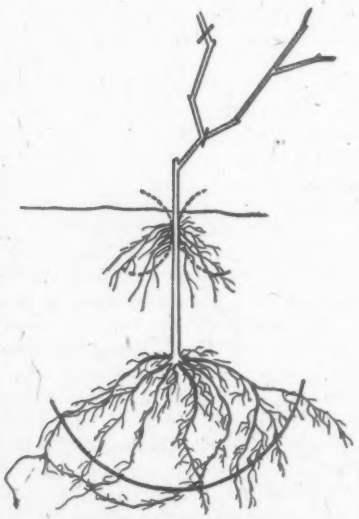
You will find courage and confidence in handling the grape the moment you realize that even a very ex-

tensive vine is not nearly the large and complicated entity you thought at first sight.

You will naturally aim at reducing the distance between the roots and the "head". Some varieties of grapes have a tendency to bushiness, notably the desert grapes and some of the *vinafera*. But in the East practically all of the descendants of the *labrusca* (Concord, Worden, etc. growing on their own roots) tend to wander. When the plant expends much of its energy wandering it does not have much left for the production of fruit.

In attempting to bring a long-neglected vine under control your best bet is to cut it back severely during the winter months. Pick out the trunk and decide which are the main branches. This isn't as easy as it sounds, you may become much confused before you finish, but do the best you can, anyway.

Having picked out what appear to be the main branches cut off all except two branches on each side of the trunk. Make the cuts flush with the sides of the trunk. Cut the trunk down to about six feet high. Your hands may get cold, and more than likely you will find it quite a problem to drag away the removed portion of the vine. Try to keep in mind the fact that the whole idea is to bring the actively growing part of the vine within a reasonable distance of the roots.



Pruning the Grape

Such treatment may cause some excessive vegetative growth the following spring. To offset this, you will remove undesirable growth, especially water-shoots—adventitious shoots which spring from the trunk or branches. The grape vine is peculiar in that it will take terrific punishment, often benefit by it. Ruthless cutting back will aid a healthy vine. It will cause the vine to turn more and more of its energies to the production of fruit rather than length of stem and branch. The amount of foliage will remain practically constant.

But suppose you are fortunate enough to be able to start from scratch. You don't have to bring a jungle of vines under control. You can choose your own vines, plant them and bide your time, select from the most luscious of the new varieties.

You decide to plant only "old-timers" and purchase a number of rooted plants: Catawba for a red, Concord for a blue, and Niagara for a white. As something special, you buy a few plants of Wallis Giant, a blue which bears berries almost twice the size of the Concord. Other varieties are Delaware (Red), Portland (White), Fredonia (Black), Concord Seedless, Golden Muscat, Seneca, Sheridan, etc. You find them in the nursery catalogues.

Your choice is somewhat limited by the location of your garden. In choosing varieties it is always wise to find out first just which varieties do best in your locality. Sure, you can ignore this, take a chance, succeed, and perhaps make a name for yourself among local gardeners, but we'll go into this matter a moment later.

During the winter you order half a dozen rooted vines of this variety and half a dozen of another. The snow drifts in triangular piles against the

corners of the basement window panes as you make your choice. There is still a touch of frost in the air when the plants arrive. How to plant them?

The roots should be cut back to about four inches. The top should be cut back to one cane and this cane should contain about three fat buds. The place where the vines are to grow should be well dug and a heavy supply of compost humus incorporated. The holes to receive the roots must be ample and widely spaced and the subsoil beneath them well loosened and broken up. The spacing of the holes will, of course, depend somewhat upon the varieties you select.

During the first year, it may be just as well to let the plants go to town. As you watch over them you will naturally cut off all except the best of the young shoots for this shoot is to serve as the trunk or main stem. It should be kept as erect and straight as possible. Careful tying to a stout stake will do the trick.

Different kinds of grapes thrive in the wild in different areas. The cultivated varieties are often merely slight modifications of the wild grape of that locality. In the north-east the Concord (*labrusca*, the woods grape) does well. In the south, the Muscadine and Scuppernong (*Vitis rotundifolia*) is the thing. On the west coast, varieties of the *Vitis vinifera*, the wild grape of Europe, are favored.

Grapes grow on a wide range of soils from heavy clays to coarse sand. Gravelly and sandy loams are best. Grapes thrive often on soil as poor as to be unfit for gardens. In some places, grapes are even planted by making room for their roots by the use of dynamite.

The important point to remember in all this is the fact that, although the grape vine may thrive in rocky soil, it does so because its far reaching and often plunging roots search every nook and corner for organic matter and moisture. The habits of the roots are reflected in the climbing habit of the plant in search of sunshine. In its struggle, the plant finds food for its roots and sunshine for its leaves, often widely separated.

Grape vines prefer a rather unfluctuating climate and a relatively steady humidity. In the wild, many vines flourish along the edge of lakes and the borders of streams. Cultivated descendants of eastern wild grapes have been somewhat bred away from these tendencies. The curious fact remains that in its wild state the plant did well in surroundings favorable to its worst enemy, the fungus diseases.

The wild grape today thrives under such apparently unfavorable conditions. How does it do this? Vineyards having excellent sunshine and air drainage are ruined by black rot and other fungus diseases. The answer is probably this: in the wild the roots of the vines tapped reservoirs of organic humus as a matter of course and as a result developed a ruggedness sufficient to withstand the ravages of fungus diseases. A point to be remembered in the use of compost at planting time.

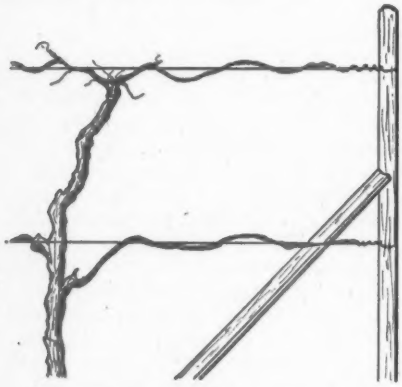
Another curious fact about wild grapes; housewives, when making grape preserves, seek out the fruit of the wild grape to add flavor, and quite possibly to add lacking food elements and obscure trace elements. This matter of the food value of the grape is an interesting thing. When you realize the important place the grape has always taken in human diet, in spite of its lack of food value, you will ask the secret. Of slight food value, ancient peoples cultivated it, improved it, even worshipped it. They seemed to understand its value instinctively. Modern scientists have only recently confirmed their estimate.

Modern analysis shows that the flesh of the grape contains some twenty per cent sugar, two per cent nitrogenous substances, malic and citric acids. The skin carries volatile substances which, largely, gathered from the sunshine, give the fruit its flavor, its bouquet or fragrance.

Not all grapes, however, have what is considered a pleasant odor. Some

accuse the *labrusca,* the ancestor of the Concord of having a "skunky" aroma and call it the "Fox grape". Nevertheless, its fruits are valued as additions to fine flavor to grape jellies.

Grapes are very low as far as vitamin and mineral content is concerned although they provide a fair amount of Vitamin B1. To a great extent the value of the grape in the diet, especially the diet of the convalescent, is brought about by its heavy supply of potassium tartrate. This substance helps to build up the alkaline reserve in the system, it also stimulates the kidneys. The potassium elements found in the grape have a rather unusual value—they are beneficial in reducing allergic reactions.



Four canes are trained on two wires (Kniffin system)

Grapes then are a sort of peacemaker. If a certain food doesn't agree with you, causes you to break out in a rash, more than likely if you have a supply of home grown grapes on hand these will be all you need to remedy the condition. Grapes have a mildly laxative action and are high in roughage although the skins of the American kinds may be hard to digest. This may be the answer to the often recurring question—why is the grape diet so successful?

The fruit as it ripens, in the wild, drops to the ground quickly. In this way it escapes consumption by birds, although its seeds in this case are deposited elsewhere, we won't go into all this right now. But the use of bags in most cases overcomes this difficulty in the cultivated varieties of the *labrusca.* It shields the fruit from the birds and the wasps and other creatures which select properly grown, organic fruit almost automatically.

Loss of berries in the bunches caused by dropping, the damage caused to them by weathering and attacks of insects can thus quite easily be prevented. If an ordinary ten pound manila paper bag is placed over each grape bunch while still green (if the flowers are known to be self fertile, the bag may be placed over the flowers) and tied to the cane from which the bunch is attached, the fruit will be effectively protected. It will form and ripen in a world all its own. Even so, in spite of the careful isolation of the bunch, the natural yeasts which are so closely related to the life cycle of the fruit will not be excluded. Invariably they will find an entrance and the grapes will also possess perfect "bloom".

The bagging of grapes not only protects the fruit from attack but the bags themselves so diffuse the sunlight as to spread it more evenly over the bunch, the temperature of the bunch is more even, and those invisible light waves which are so important in all growth are not at all impeded by the organic nature of the covering.

How best to cause the vines to thrive and bear fruit? In the wild state the roots of the vines seek out little pockets of organic matter amongst the rocks. You can easily supply this substance by digging in ample quantities of compost humus. Properly composted material also makes it possible for the roots of the vine to connect with the hyphae of the mycorrhizae, an important and benevolent microscopic fungus.

This fungus is all important. It is likely that its own health and growth is dependent upon the health

of the plant roots and substances which they excrete. It makes possible the absorption of large quantities of phosphorus which would otherwise not be possible.

The mycorrhizae thrive and the vines thrive; if the mycorrhizae fail, then the vines may die. Before you set out a single plant you should get this point clearly in your mind. The successful growth of a single vine or a large fruit tree depends upon this association.

Complicated as this may seem, you can load the soil down with chemicals, if this micro-fungus fails—and it more likely will as the result of the heavy application of chemicals—the plant will fail also. A heavy mulching of the roots using compost if possible will do the trick. If compost isn't available, a good substitute is half rotted leaf mold, straw, or even just piles of leaves. In the wild, leaves of the trees upon which the vines climb are heaped around the roots of the vines and form a natural mulch.

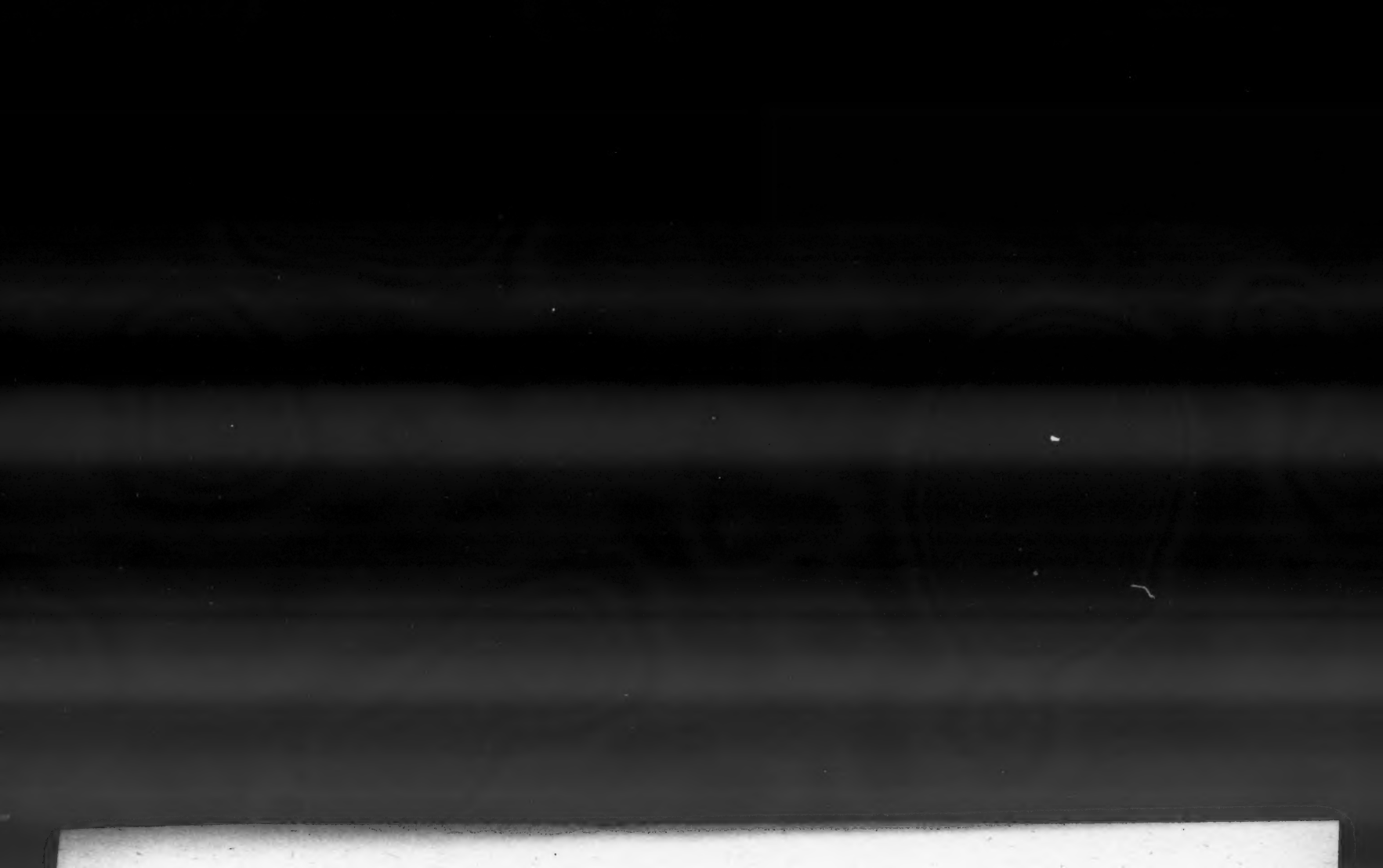
Probably no plant will accede to your demand better than the grape. The wildness of it gives it vigor; it will submit to and survive very rough treatment. No wonder it has been loved since time immemorial. Given only a fair idea of its habits it is quite possible to grow *vinifera* grapes grafted on native roots in the east. But the growth habits of the *vinifera* (California grape) is something else again.

Spray Removal

ONE OF OUR readers sent us the homely recipe of mixing lemon juice with salt to remove lead arsenate spray from grapes and other fruit. Since I had my doubts whether the metals would be dissolved by lemon juice and salt, I asked Professor Frear of Pennsylvania State College for an opinion. Professor Frear did more, he made an experiment according to the directions and found that, after leaving the fruit for an hour in the mixture, the major part of lead arsenate, in fact 95 per cent of it, were undissolved. "It is difficult to understand why people object to the use of hydrochloric acid, since the human stomach fluids contain this acid in fairly respectable amounts," adds the distinguished chemist. So we come to the conclusion that sprays of this sort must be removed by the old method, not by lemon juice and salt. The method described by Dr. Effingham in our booklet *The Fruit Orchard* is thoroughly sound. And the book, *The Grape Cure* by Johanna Brandt (Harmony Centre, 380 Riverside Drive, New York City), gives the following recipe for removing sprays from grapes: "Buy one ounce of chemically pure hydrochloric acid, mix this thoroughly with three quarts of water. This is approximately a one per cent solution. The spray solution should be kept in an earthenware crock. The vegetables are first washed in the ordinary manner, then placed for five minutes in the spray remover and rinsed in water again. The spray remover may be used by the average family of five for about a week." Ordinarily the solution is made a little stronger, and care must be taken with the undiluted hydrochloric acid. Do not use metal spoons in stirring it, but wooden ones.

Single-Flowered California Poppy

W. Atlee Burpee



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ORGANIC GARDENING — Emmaus, Pa.

Over the Fence

by H. K. MEYER

I received an enjoyable funny letter from an old friend who wrote: "I have about a hundred dollars' worth of flower seeds on hand and wish you were here to tell me how to make them germinate. In my previous experience the more expensive seeds are the ones which don't come up. Unfortunately, I'm not the Boyce Thompson Institute where all seeds germinate. I often wondered how they do it up there and then tell us of the conditions under which these exceptional seeds will grow. If they didn't know the conditions beforehand, how did they get the seeds to come up?" It's like the old man who heard that a new planet was discovered whose name was Neptune. He shook his head and asked: "If it has just been discovered, how do you know its name is Neptune?" But if you really want to know, they germinate their seeds in sphagnum moss, the way I described in *Questions and Answers* in the March number.

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THE WILD INSECTS have a way of disappearing as soon as intensive cultural practices of man come to a region. Wild bees and wasps, among others, find poor living conditions when hedges are leveled out, when stones are removed, and when chemicals are spread. We have previously shown how the disappearance of wild bees, especially bumble bees, reduced the seed crops of the various clovers. *The American Midland Naturalist* recently had a report by Dr. LaRivers about the black wasp. One million Mormon Crickets are destroyed per square mile, one million crop-destroying insects are eaten by the black wasp. This wasp does no harm to any human enterprises, it helps gardeners and farmers; but do *we* help *it?*

•

The *Seed World* published a letter from Mr. Witts in Herfordshire, England, who had bought American seed. "The results exceeded all expectations. The crop produced was the best I ever had." Such an experience proves that American seeds are highly adaptable to varied conditions, a matter which was widely tested out during the war years when carloads of our seeds were sent abroad. The reason for this is not only the efficiency of the seed industry in this country, but the fact that we have varied conditions right here and therefore produce plants of great adaptability.

•

PAPER MILLS NEWS reports, according to the *Chermurgic Digest*, December 15, 1945 that the New Hampshire Experiment Station experimented with lignin as a source of soil organic matter. "The plants treated with lignin were a darker green in color, had a more abundant foliage, and there was a marked stimulus to growth particularly in the early stages." There is the making of a great biochemical fertilizer industry of the future!

The *New York Herald Tribune* of January 2, 1946 contained an item, *Carbon* 13, which surprised me very much. This isotope, according to Werkman of Iowa State College and E. A. Evans of the University of Chicago, proved very fertile in biochemic experiments. Contrary to a long established theory, human bodies utilize carbon dioxide in the air, these scientists are reported to have found. It looks as though we were not so far away from plants after all. For the plants get their energy from that very same gas, as we have shown in the booklet on *Leaves and What They Do.*

•

The Calville Apple again! Just before you start worrying your Nurseryman or your Experiment Station, let me tell you that *you cannot buy a Calville tree* in the whole United States. The famous tree with the famous vitamin-producing apple is an exceptional thing with which the government experts are working; but its apple is not delicious like the Calville Blanc or Winterkalvill of Europe. These just won't become acclimated here. Still, the breeders are working with the problem. We hope to hear from them directly before long.

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The vitamin-conscious public does not always seem to realize that a healthy diet is all that anyone needs as a supply for vitamins. On a recent visit to the United States Nutrition Laboratory at Cornell University, one of the scientists told me that he never used pills, but tried to obtain his vitamins from normal food. Now the *Science News Letter* publishes facts about the danger of concentrated vitamin doses. Vitamin D, for instance, has produced serious afflictions of heart, kidneys, and arteries, leading to death, and should not be taken except under a physician's care. I myself have never eaten a vitamin in my life, unless I did it accidentally with my ordinary vegetables, whole-rye bread, etc.

The Associated Press reported from Pullman, Washington, on December 1, 1945, that DDT proved very disappointing in the Pacific Northwest. Paul M. Eide, a well-known entomologist with the Experiment Station, said that the cherry fruit fly was little affected by the poison.

•

The Flower Seeds grown during 1946, according to E. D. Martin of the Franklin-Waller Company, will comprise 820 varieties. "Prior to the war we had approximately three thousand varieties under production." Prior to the war, field labor cost the seed growers in California 35 cents an hour, last season it was from 60 to 70 cents. Again, I say, it's amazing that you can buy a hundred wonderful carnations in seed form for 25 cents.

•

This winter I thought of the carp we used to eat as children in the old country. It was a delicious fish with a wonderful sweet meat. When carps were introduced to America, they were not cultivated in controlled ponds, but allowed to run wild. That is why they have a muddy flavor, if flavor you can call it. The old fishery expert of Europe took care that a few rapacious pike were placed in every carp pond to keep the carps stirring. Thus man utilized ecological factors and provided for his domestic carp conditions similar to those that occur in nature.

•

Another curious instance of industry's using nature for assistance was reported in the 57th annual report of the Pennsylvania Experiment Station. Pulp wood was left in the open until the bugs had peeled off the bark. The paper industry had no objection to the final product and did not dock the sellers. But the process is in its first

stage and you had better wait a little before you cut down your forest.

•

The present bestseller, *January Thaw,* makes a wonderful argument for the self-sufficient farmer and gardener. When rationing started, when the current went off, when the modern plumbing froze, the old-timer was prepared for it, while the modern family had to eat dry cereals. This is a humorous story which I enjoyed reading. L. B. Reber recently said in the *Rural New Yorker*: "Yes, I know a stove is oldfashioned but when you come in with your fingers and toes nipped by the frost, you just can't beat it." I don't think that anyone would argue with Mr. Reber.

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Speaking of books reminds me that the Government is one of the biggest, if not the biggest publisher. We are stockholders in this publishing enterprise and therefore can buy our own products at low cost. The Superintendent of Documents, Washington, D. C. will send out lists of free booklets for the asking. How to grow peppermint, how to care for ornamental trees and shrubs, how to grow Easter lilies commercially, how to build coldframes or green houses, how to make a corn crib, and many other interesting matters are answered this way. But there are also many fine books, well bound, yet inexpensive. Of these I'd like to single out Van Dersal, *Native Woody Plants of the United States,* Dept. of Agriculture, Miscellaneous Publication No. 303, $1.75. It has beautiful illustrations and two excellent maps of growth regions that beat everything else on the range of flowering shrubs. If nurserymen ever get hold of these maps! You can actually see from this book which plants can be grown in which regions. The map of Mr. Mulford on plant growth regions is the real thing, while the various "zones" which appear in the textbooks are merely figured out with a thermometer. They indicate possibilities, but Mulford's map gives you actual facts.

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Well, Russell Lord had a good comeback. I mis-spelled his name every time I used it. But his magazine, *The Land,* is good and will have an interesting symposium on *Pay Dirt,* even if Russell's farm is 23 acres, not 2000 acres. There was a dot in it that I overlooked. It seems that there is a hex on our relations. And since I am in the midst of confessing errors and mistakes, I should apologize for the occasional misprints in the magazine. They always occur in the worst place, among figures, chemicals, etc. And naturally, I didn't plant cacti in *spots,* but in *pots.*

HEMP is one of the dioecious plants, which means, it is separated into a male and a female plant. Its fibers make excellent ropes and its dried leaves and flowers yield a drug which is smoked in the East as hashish and in the West as marijuana.

HOP is a relative of hemp, but a native of more Northern climates. Its flowers contain lupulin, which is a strong microbe killer and can therefore be used as a preservative for beer. Lupulin is also employed as a sedative for wrought-up nerves.

The Role of Carbon Dioxide In Composting

By HOWARD DOLF

ALTHOUGH many of us accept the fact that the proper manipulation of decaying organic matter will provide a substance for growing plants that is superior to chemical fertilizers, there are some of us with a touch of scientific curiosity who would like to know why this is so.

Many writers on this subject favor the idea that the improvement of the soil, by addition of properly made compost, constitutes the principle factor by which better plant growth is achieved. But this writer would like to call attention to the fact that the condition of the atmosphere which surrounds the aerial parts of the plant is just as important as the condition of the soil in which the subterranean parts of the plant are located. No matter how perfect the medium is in which the roots of a plant are placed, without a proper environment for the leaves to function in no plant can be expected to lead a normal and healthy life.

It is an accepted fact, proven by scientific experiment that carbon dioxide is as necessary to the life and growth of a plant as oxygen is necessary to animal life. The plant needs a constant supply of carbon dioxide. This is supplied by the air which surrounds the leaves of the plant. As air is more or less in constant motion a fresh supply of CO_2 is always available. But it might be interesting to know that the proportion of CO_2 to air is small—3 parts per 10,000 by volume—so that a constant supply of fresh air is quite necessary for the plant in order to thrive.

Now since the world contains a large amount of plant life one would begin to wonder if, sometime, the CO_2 supply would not disappear. However, nature has provided for a continuous supply of CO_2. All dead organic matter decays and ferments back to the simple elements it was built up from, mainly CO_2, water and traces of mineral salts.

This brings us back to our main topic: the role of CO_2 in composting. Besides improving the soil, compost is a material that is at just the proper stage for conversion into a ready supply of CO_2 for the plant. Edwin C. Miller, in his book Plant Physiology, records the work of several experimenters studying the effects of an increased supply of CO_2 above normal atmospheric conditions on the growth of plants. In most cases, they discovered that plant growth was increased and that the plants were in a healthier state when the supply of CO_2 was greater than the normal 3 parts per 10,000 by volume. It was noted also that several of the experimenters remarked that an increase in CO_2 concentration could be produced by proper manuring with organic fertilizers. As an added thought, it would seem logical to me to suppose that the good effects caused by loosening the soil near plants releases CO_2 which has been trapped in the earth. Also the removing of weeds allows more CO_2 to be used by the cultivated plants.

The increase in CO_2 concentration may also cause fewer insects on plants where compost is used. Interested persons have noticed that in volcanoes where the concentration of CO_2 is very high no insects can live.

Although there is a constant supply of carbon dioxide in the whole atmosphere surrounding the earth due to decay of organic matter, it is wise for the grower of plants to control this decay by the use of compost so that its end products may be used more beneficially, than is provided by the haphazard methods of mother nature.

Phoebe

Birds Useful to the Gardener

By RICHARD HEADSTROM

ALTHOUGH March is now behind us and April is with us once again, I still carry with me the memory of one morning in early March when suddenly I saw a flash of cerulean color among the naked branches of a roadside maple. I knew then that spring was just "around the corner" for had not the bluebird arrived from his winter's stay in the southland?

We welcome this lovable bird with his soft warble and gentle manners for, with the exception of the robin, no other bird shows such a decided fondness for human society. If we place a birdhouse on a nearby tree or on a tall post he will quickly take possession of it and throughout the following weeks will reward us with many delightful moments for having provided him with a ready-made home.

Indeed, he will do more than entertain us; he will also help us to get rid of various insect pests that make gardening or farming so discouraging at times. He is one of our truly useful birds and I know of no one who has accused him of stealing fruit or preying upon crops. His diet consists mostly of insects (about 68 per cent) and their allies, such as spiders and myriapods, and such vegetable food as he does eat—pokeberry, partridgeberry, greenbrier, chokeberry, Virginia creeper, bittersweet, strawberry bush, wild sarsparilla, wild spikenard, sumach, rose haws, sorrel, ragweed and grass—are of little value to us. He is of particular service in August and September for then grasshoppers make up about 53 per cent of his diet. Those of us whose orchards are overrun with harmful insects, caterpillars and others, would do well to cultivate the friendship of the bluebird for he will repay any kindnesses we extend to him many times over by destroying our insect enemies.

The bluebird is the first of our migratory song birds to return from the south but is closely followed by the robin, perhaps the best known

of all our birds since his distinctive plumage, his reputation as a harbinger of spring (which is more deservedly the bluebird's) and his fondness for human society make him familiar to all.

The robin has been indicted as an enemy because of the great amount of small fruit which he eats. It has been shown by stomach analysis that vegetable food comprises about 58 per cent of his diet, 42 per cent or more being wild fruits and only about 8 per cent being possibly cultivated varieties, although this amount increases to about 25 per cent in June and July. The reason for the sharp increase in these two months is possibly due to the fact that the bird up to this time has been feeding on insects, earthworms and dried berries and being satiated with such fare finds the early ripening cherries and other small fruits rich juicy morsels too tempting to pass up. He has not been found guilty of eating apples, peaches, pears, grapes or even late cherries because by the time these fruits ripen the woods and roadsides are teeming with such wild fruits as dogwood, greenbrier, barberries, hackberries, elder, wild cherries, wild grapes and others which are apparently more to his taste. If such wild fruits are not abundant and the robin takes to eating cultivated fruits we ourselves are to blame for having destroyed the wild fruits and berries which form his natural diet.

If we have thus made him an unwilling pest, the robin himself wishes to have it otherwise and attempts to offset the harm he unwittingly does by destroying enormous quantities of noxious insects. For those statistically minded the remaining 42 per cent of his food consists mainly of insects, broken down as follows: beetles 16 per cent; grasshoppers 5 per cent, although this increases to about 17 per cent in August; caterpillars 9 per cent; and various insects, spiders, snails and angleworms 12 per cent. All of these insects eaten are not necessarily harmful species, (about 5 per cent of the beetles eaten, for instance, are useful ground beetles) but I think it safe to say that a third or more of the insects eaten by the robin can be classified as destructive.

Robins have been killed because of the ravages which they have committed in some fruit-growing regions. But since they eat ten times as much wild fruit as cultivated fruit it seems inexcusable to destroy these birds in order to save so little, particularly when they make amends by destroying noxious insects. As a matter of fact, the robins, by feeding on such insects, have been helping the orchardists all season to make their crops possible and that when the fruit ripens the orchardists are indebted to them for services rendered. It is, as I see it, wholly unnecessary to destroy the robins at any time or in any region for with a little care and effort both the birds and the fruit can be preserved. If wild fruit is not abundant, cultivated crops can be protected by planting fruit-bearing shrubs and vines to provide the birds with their natural food and which, incidentally, would be ornamental as well, and where fruit is grown in large quantities it would be no great loss to set apart a tree or two for the birds, although in some cases the fruit trees can be protected by scarecrows.

About the time that we catch our first glimpse of the bluebird and robin we may hear the familiar note of the phoebe about the barn, in the orchard, or along the rushing stream. Here indeed is the gardener's real friend for the phoebe subsists almost exclusively upon insects, over 99 per cent of his year's food consisting of insects and, more important, the insects eaten are chiefly noxious species. Foremost in the phoebe's insect diet are hymenopterous insects, which are eaten with great regularity and which constitute, moreover, the largest item in every month. A few parasitic species, unfortunately, are eaten but these are more than offset by the vast number of destructive sawfly larvae which are destroyed. Beetles rank second on the list of insect food and include such harmful species as the click beetles,

May beetles, corn leaf-beetles, the 12 spotted cucumber beetles, the striped cucumber beetles, the locust leaf miners and such weevils as the notorious cotton-boll weevil, the strawberry weevil and others. There is perhaps no more useful bird around a garden or farm than the phoebe and he should be encouraged to nest in the vicinity by protecting him against cats and other marauders.

The phoebe among others belongs to a family of birds called Flycatchers and includes, among others, such species as the kingbird and wood pewee. They are all insect eaters and for the most part catch their food on the wing although they will also pick up some insects from trees and shrubs and at times will even descend to the ground in search of such animal forms as millipedes.

The kingbird is a useful bird to have about a garden or orchard, or a poultry yard for that matter, for not only does he destroy a large number of harmful insects but his remarkable courage and persistent aggressiveness in attacking his natural enemies, especially hawks and crows, make him a valuable ally to have around as a protection against such birds of prey that feed on young chickens and other barnyard fowl, to say nothing of our song birds. I have seen a kingbird attack and drive off a cat that was stalking a nestling which had fallen out of its nest, and on one occasion a pair of these birds pounced upon a hawk that had swooped down upon a flock of young chickens and so buffeted the predator that he was glad to escape without his prey.

A careful investigation of the stomach contents of some 665 kingbirds made by experts of the Biological Survey reveal that about 85 per cent of the kingbird's food consists of insects, most of which are harmful species. May beetles, click beetles, blister beetles and weevils are eaten in large numbers, as are wasps, ants and wild bees. During the summer grasshoppers and crickets fill a large part of the menu, as well as leaf hoppers and other bugs. The complaint has been made by bee keepers that the kingbird preys largely upon honeybees. But of the 665 stomachs that were examined only 22 were found to contain honeybees and in these 22 stomachs there were in all 61 honeybees of which 51 were useless drones, 8 were workers and the remaining 2 were so badly mutilated as to be unidentifiable. If the few honeybees that the kingbird eats are debited to his account, he can, on the other hand, be credited with destroying robber flies. These insects prey on honeybees and by reducing their number the kingbird performs a real service to the apiarist. Twenty-six robber flies were found in the 665 stomachs and these, I think, more than balance the 8 worker honeybees.

The entire family of Flycatchers has been indicted as being harmful to honeybees but careful stomach examinations do not sustain this accusation. A few are eaten, of course, but these few are mostly drones or males so that the harm done in this direction is negligible. If the flycatchers do any harm at all it is in the destruction of parasitic and predaceous hymenoptera. So few predaceous hymenoptera are eaten, however, that their loss is of no practical importance. As for the parasitic species, it is true that some are taken by most flycatchers and that considerable numbers are eaten by the smaller species, the wood pewee being probably the worst sinner of the whole family in this respect. It has been estimated that about one-fourth of the ants, bees and wasps eaten by this bird are parasitic species. Theoretically this may seem to be inimical to the interests of the gardener or farmer but practically the amount of damage done may not be as great as is supposed, for it must be borne in mind that the parasitic species destroy useful insects, including other parasites, or are themselves destroyed by other insects. The end result would appear to involve a problem which is so complicated by a number of factors that an exact solu-

tion could probably never be arrived at.

Although there is no question but that the wood pewee does some harm in destroying useful parasitic insects, it must be remembered that the bird destroys many noxious species, such as plum curculios, corn weevils, clover-leaf weevils, rice weevils, horse-flies, robberflies, tree-hoppers, leaf-hoppers, squash bugs, moths and caterpillars. All in all I think we can condone the loss of a few useful bees and wasps in return for the help which the wood pewee renders in ridding the world of many annoying or harmful insects. In this respect the bird confers a real benefit upon us.

The wood pewee can be said to subsist almost entirely on animal food since 99 per cent of his diet is of animal origin. Another bird that feeds almost entirely on animal food is the house wren. An examination of 52 stomachs showed that 98 per cent of the contents was made up of insects or their allies, and only 2 per cent was vegetable matter, including bits of grass and similar material which apparently were taken quite by accident with the insects. Unlike the wood pewee the house wren does not feed, as far as is known, on any useful species and for this reason can be said to be entirely beneficial. Half of the bird's food consists of grasshoppers and beetles and the remainder of caterpillars, bugs and spiders, all with the exception of the spiders being harmful species. These diminutive birds are industrious foragers and overlook no tree, shrub or vine for caterpillars; even posts and fence rails or other crannies or crevices are meticulously examined for insects and for this reason they should be encouraged to nest about our gardens and orchards except when they might unduly interfere with the nesting of other birds for they are pugnacious creatures and will often take to driving away the rightful occupants of birdhouses or other nesting sites.

There are many other birds that help to keep down the insect population, such as the brown thrasher, the chickadee, the catbird, the swallows, the towhee, the Baltimore oriole, the nighthawk, to name a few. The meadowlark also belongs in this list for this bird is highly useful in devouring ground caterpillars which are habitually overlooked by birds that frequent trees. Crickets and grasshoppers are the most important food item, constituting 26 per cent of the food of the year and 72 per cent of the food in August. Beetles come next and include such harmful species as the May beetles, the grubs of which are among the worst enemies to many cultivated crops, notably grasses and grains, and to a less extent strawberries and garden vegetables. In May cutworms constitute over 24 per cent of the meadowlark's diet, and as this is the month when these insects begin their deadly careers the meadowlark at this time renders a distinct service.

Hairy caterpillars, as a rule, are not relished by most birds, but two species, the yellow-billed cuckoo and the black-billed cuckoo, seem to prefer these to the smooth kind. Of some 109 stomachs of the yellow-billed species that were examined one was found to contain as many as 250 tent caterpillars, probably a whole colony in the young stage, and another 217 fall webworms, and this probably fell far short of the real number as these caterpillars are very small, and in many instances nothing but jaws remained undigested. These birds eat so many hairy caterpillars that the hairs, which are frequently stiff, bristly and sharp, sometimes pierce the inner lining of the stomach and remain there so that when the stomach is opened it is found to be lined with a thin coating of fur.

The cuckoos, despite their fondness for hairy caterpillars, do not by any means confine themselves to these insects but also devour beetles, grasshoppers, sawflies, and bugs of various kinds, most of them of a harmful nature. The cuckoos are extremely useful but unfortunately they are rather shy birds and prefer to remain about

the edges of woodlands and groves rather than take to the more open cultivated grounds and orchards although if unmolested they sometimes gain enough confidence to frequent trees about houses and lawns.

So far I have said nothing of the many birds that are of use to us in helping to get rid of weed seeds. Pre-eminent among these seed eaters are the sparrows, inobtrusive birds which go about their work of doing away with vast quantities of weed seeds in a very efficient manner. Their work begins even before the seeds are ripe and continues throughout the fall and winter and even far into spring. In late summer the seed-eating habit of these birds is so noticeable as to attract the attention of even a casual observer, for by this time the seeds have ripened and the young sparrows which have fed on an insectivorous diet are ready to turn to vegetable food. In winter, too, we may find flocks of juncoes and tree sparrows feeding in weedy fields, and it has been estimated that the tree sparrows consume per individual about one-fourth of an ounce a day and in a large agricultural state like Iowa some 875 tons annually. Only a farmer who must free his land from noxious weeds can realize what this vast consumption of weed seeds means in the saving and cost of labor. The above estimate is for a single species only, while, as a matter of fact, there are at least half a dozen species such as the white-crowned sparrow, the white-throated sparrow, the fox sparrow, the song sparrow and several others, that habitually feed during the winter on weed seeds. Some of these birds, moreover, range further south than the tree sparrow and junco so that over the entire country there is, during the colder months, a host of seed eaters at work reducing next year's crop of useless plants.

Health of Plants and Fertility

THE POSITION taken by *Organic Gardening* that well nourished plants are less susceptible to diseases was ridiculed for some time by the advocates of more and more spraying and chemical treatment. The Geneva station of New York State has since shown that fertile soils produced healthier crops, and Swift and Co. have begun to advertise "Fertilizer reduces Plant Diseases". Now comes the Alabama Station, from which Volk reports in the *Journal of the American Society of Agronomy,* January 1946, that cotton rust was eliminated by applying adequate amounts of potash to the soil. The organic gardener applies potash in considerable amounts by composting plant residues. Nobody knows what potash actually does for the plant, though many opinions are going around as if they were proven facts, nobody knows even how potash will react in a soil, as Hoagland describes in his magnificent *Lectures on the Inorganic Nutrition of Plants,* Chronica Botanica, 1944. But we know that potassium in the form of decomposed vegetable matter goes with *every* type of soil and with every kind of plant.

The Tritonia Becomes Naturalized

By OTTO DEGENER,
New York Botanical Garden

THE Tritonia is not a direct product of nature but of man. It is the result of crossing two African plants belonging to the Iris family. The one is botanically known as *Tritonia Pottsii* Benth. and Hook., while the other is *Crocosmia aurea* Planch. The resultant hybrid, first blooming in 1880 in France, where it was named *X Tritonia crocosmaeflora* Lemoine, is almost invariably sterile and unable to produce seed. This inability of hybrids to reproduce when their parents are very distantly related is common to both plants and animals. Among the latter, the mule, a sterile cross between the donkey and the mare, is a well-known example.

The tritonia bears long, slender, upright leaves. These are attached to a stem, called a corm, that somewhat resembles an onion bulb in shape. From this, subterranean branches arise to radiate in all directions and to give rise at their ends to a second series of corms and uprigh leaves. This type of growth continues indefinitely, the slender underground branches between the corms finally dying and isolating the newer growth into separate plants distinct from the old. Thus a colony of tritonia can rapidly spread over a field even though no seed are produced.

In driving from Hilo to Kilauea (in Hawaii), the visitor may see long, slender wands of brilliant orange flowers, giving color to the roadside. This is tritonia, often incorrectly called montbretia, introduced into these islands as an ornamental probably before 1900. It has escaped from cultivation and now grows naturalized in moist meadows and similar places in various districts on the island of Hawaii as well as at the head of Waimea Canyon on the island of Kauai.

EDITOR'S NOTE: From Mr. Degener's new and well illustrated book, *Plants and Customs of the South Seas*, published by the author. Mr. Degener, for years a botanist at the University of Hawaii, Naturalist of the Hawaii National Park, Collaborator at the New York Botanical Garden, is well versed in South Sea plants and customs. He was the botanist of the Archbold Expedition to the Fiji Islands and is again on his way to the Pacific right now. Otto Degener is the only botanist alive who has the distinction of having his name connected with a plant genus.

Compost In Central America

A letter from Mariano R. Montealegre, former Minister of Agriculture of Costa Rica, to J. I. Rodale

I BEG to reply to your letter dated August 9th., last which I have just received.

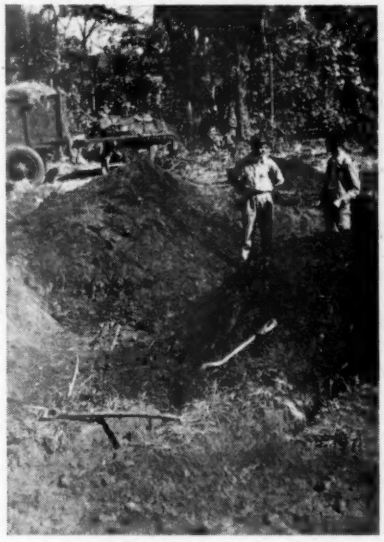
Sir Albert Howard's Indore Method has been known here for quite some time; in fact, this was the first country in America to experiment with it, but its use is not as yet as widespread as I would wish it to be. You know how difficult it is to bring new ideas into being and specially to make farmers change their routine.

The use of strong chemical fertilizers has been in vogue in our coffee growing industry for the last fifty years and the ability of the German manufacturers has created a chemical fertilizer mind which is difficult to eradicate.

Long before I knew about Sir Albert Howard's process, I had abandoned the use of chemical fertilizers in coffee plantations under my care and had substituted for them the organic fish manure.

After having used this fish manure with amazing results for several years, I started a campaign against chemical fertilizers in favour of organic manures. After five years of strenuous work we had the satisfaction of convincing most of the big growers to use it, and when the war broke out in 1939 a good 75% of them had substituted fish manure for the old German compound. Since then this supply has been cut off and some of the growers have gone back to chemical fertilizers but on a very small scale thanks to the very limited amount available in the U. S. A., our only possible source of supply.

I believe that most coffee planters in this country are now convinced of the great waste of money that is envolved in the use of concentrated chemical fertilizers which as you know



Turning the Heaps

is even greater in the tropics than it is in the temperate regions. I think that after the war its use will be restricted to the very few that refuse to be convinced.

With the German supply closed and the very limited amounts received from the U. S. A., we hardly imported any fertilizers during the first four years of war. Therefore those using the Indore Compost have used it with the exclusion of strong chemicals.

The application of the Indore Process is as yet very limited in Costa Rica; in fact it has been confined only to a few progressive planters who are doing it tentatively.

The "Process" is really quite new and for its general use it needs a lot of educational propaganda. Your book, Pay Dirt, I am sure, will do a lot in

this direction and I hope that your idea of publishing a Spanish edition will come true in the near future. We need it badly. Nothing that we can do about it here would do so much good as a book written by such an authority on these matters as your goodself.

If I may make a suggestion I would take the liberty of advising you to emphasize on every opportunity available, the fact that the method is entirely sanitary; that there is no danger to health and that if carefully handled there is no cause for fly breeding during the whole process.

I mention this because we have already had a lot of trouble with the Sanitary Authorities in this City. They refuse to believe in the absolutely sanitary condition of the process even when they see the results and are entirely opposed to the transformation of the wastes of the town into compost, which they insist on burning.

I induced the San Jose Garbage Disposal Contractors to start a small plant right at the station known as the "Crematorio" and they seem to be doing very well; their product is well liked by the flower and vegetable gardeners around town, but they have experienced no end of trouble caused by the Health Authorities.

I am sending you under separate cover the report "Experiments on the Production of Compost in Costa Rica" carried out by the Institute of Inter-American Affairs.

These experiments were undertaken during 1943 and the early part of 1944, at my request, when I was Minister of Agriculture and had the double purpose of teaching the farmers the value of the compost and of demonstrating to the Sanitary Authorities that its preparation does not involve any danger to Public Health.

The experiments were conducted in a thorough manner and I feel that the report will be of interest to the readers of "Organic Gardening". I would be delighted if you would emphasize the wonderful co-operation and disinterestedness taken by the Institute of Inter-American Affairs in the application of this process, inasmuch as I consider it a great credit to this American Organization which has done so much for the advancement of our Agriculture during the short time that it has been in existence.

The disposal of the coffee waste products has always been the great problem in our coffee industry, for although it is easy to dispose of the solid part by burial, there remains a very large amount in liquid form which goes into the mountain streams where it decomposes and pollutes the water. Our plan is to use as much as possible of this liquid which is very rich in nitrogen to wet the pits, enriching the compost and minimizing the danger of its polluting the stream waters.

The difference between the costs of production and the monetary value of the finished Compost is so great that it could easily be made into a source of income to the town if they would only be permitted to change this wasteful practice of destroying garbage by fire for the really sensible one of utilizing it for agricultural needs. The stumbling block is, as already stated the Health Authorities and until this is not overcome, our efforts will continue to be of little value.

I had the opportunity of discussing this matter with Mr. Henry Wallace, Vice-President of the United States, during his visit to this Country last year. He was very enthusiastically impressed and we had a long conference with Dr. Earl N. Bressman on the advisability of making exhaustive experiments through the Institute of Agricultural Sciences at Turrialba.

I am now writing to Dr. Wilson Popenoe, director of the new Agricultural School: Escuela Panamericana de Agricultura at El Zamorano, Honduras trying to interest them in this venture. This school is sponsored by the United Fruit Co. and although already in operation for over a year was officially inaugurated on the 12th. inst. by Mr. Wallace. I think this is the kind of institution that, if really in-

terested, could do a good deal in the propagation of the new doctrine. It is a school opened to boys of all these countries and the instruction imparted is both in the theory and practice of agriculture. The students are supposed to do all the hand work on the farm and so could do both the experimenting and applying of the process with the great advantage that after leaving school they will spread it wherever they go. I am sure that Dr. Popenoe would appreciate a letter from you, and I of course would be delighted if you mention the subject to him as there are several boys from this country already there.

As far as to what has already been done in other Central and South American Countries my information is very scanty. A lot has been written about the Indore Process but I really know very little about practical issues in those countries. From direct information I know that at least in Guatemala and El Salvador the method has been tried with great success by Mr. R. Cofino and Mr. Eugenio Araujo respectively. Mr. Cofino is a coffee planter at La Antigua-Gautemala, and the news of his success were confirmed a few days ago by Mr. Walter H. Klee, manager of the Naca Fertilizer Co. of Jacksonville, Florida. Mr. Klee said to me that he had visited this farm and that the whole of it, over 100 acres, was manured with compost made by the Indore Process, that the coffee looked perfectly healthy and had a wonderfully good crop on the trees. I also know that his example has been followed by his neighbours and that the method is spreading.

I hope that this information will be of some use to you.

Allow me now to congratulate you on your Organic Gardening, a magazine that I read with real pleasure and interest. I believe that you have taken the right cause; a magazine written in plain language, with practical hints and as few technicalities as possible is what the farmer needs and that is just what you are giving him. As you know I have been making free use of it for my publications here.

With nothing further, I beg to remain,

Yours very sincerely,

Mariano R. Montealegre

EDITOR'S NOTE: Don Mariano is the former Minister of Agriculture of Costa Rica and Editor of the famous Revista del Instituto de Defensa del Cafe de Costa Rica, widely read coffee journal in Central and South America.

Composters at work.

Tea Plants

By ROBERT O. BARLOW

1. THE BUCKTHORNS

Alder Buckthorn—Rhamnus frangula

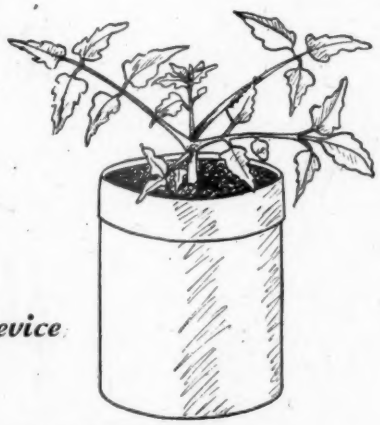
IT occurred to me the other evening that I should alternate the Poisonous Plant series with a row of articles on medicinal plants, especially tea plants. After all, many more people, health-conscious and sick, use teas than poisons. Since this issue will carry several articles on grapes, I picked a relation of the grapes, a cousin in the order of plant families, the Alder Buckthorn or *Frangula,* which goes under the Latin name of *Rhamnus frangula.* Its dried bark is sold as frangula and used in the drug trade in various forms. Closely allied to frangula are some other buckthorns, especially *Rhamnus cathartica* or buckthorn berry and *Rhamnus purshiana,* the source of Cascara sagrada. All of them are shrubs rather than vines; the Cascara bush is native to North America and preferred in American drugs, while frangula is a native of Europe and more widely used there. Both are, however, employed by herbalists and nature healers all over the world.

The active principle in these plants is a form of emodin, which also occurs in Rheum, the rhubarb root. There also is chrysophanol. These substances have a cathartic effect on the intestines and are therefore employed in cases of chronic constipation, when stimulation of the lower intestines is desired. If you used the material fresh, the irritation to the stomach walls and to the intestines would be disastrous; serious vomiting and great pain would result. It is common practice, therefore, to use the bark of frangula and of cascara in dried form; in fact, frangula bark is used only after a year's drying or after a quick drying for 48 hours at 37.7° (Centigrade).

The bark is finely chopped and used as a tea, not more than thirty grains or two grams in one administration. Mixed herb teas frequently contain it, together with sedatives, diuretics, and other balancing agents, to be used for spring cures. The old method of giving the system a good spring cleaning is rather antiquated, of course, since the body is not a musty house that can be aired and cleaned in one operation. Yet, throughout the ages, among primitive tribes and civilized nations, spring tonics were in common use. In our own time when we can obtain fresh green vegetables all the year round, when fresh fruit from the warmer climates appears on the fruit stands of all the stores, that old winter desire for something fresh does not develop with the old strength. But imagine the days before modern marketing and transport facilities! People's systems became sluggish during the long Northern winters when the only fresh vegetables were the stored

roots in the cellar and the few winter apples. As Easter finally came around and as the first fresh spinach arrived on the table, spring really came into the diet. In order to get rid of winter in one's system a drastic cure was desired, and herb teas, such as faulbaum or frangula, served the purpose.

We do not know yet how the active agent, frangulin, acts on the system. Enzymes do not break it down, the body temperature cannot melt it, but water dissolves it. Connected with it is another substance that is not soluble in water. Maybe, those sharp crystals irritate the system directly, much as the oxalic acid needles in rhubarb may do. But the purging effect is so noticeable that the oldfashioned doctors always resorted to it. Just as full-blooded drinkers and eaters asked for a purge—had their blood let—, just so they wanted a drastic cleaning out. Then they felt that the winter's lethargy had been driven away. To some extent, then, the effect on their health may have been psychological. Nevertheless, the modern dispensatories have not dispensed with these medicinal teas, a sure sign that the old herb specialists are not yet outdated.



Gardening Device

POT SUBSTITUTES

FLOWER POTS have been among the most difficult things to obtain these years. When seedlings are pricked out from the flats and transplanted, we had only paper pots and small cans. Ingenious gardeners have made use of discarded ice cream containers to give their tomatoes or beans a good start. It is wise to make a hole in the bottom to get proper drainage. The wax paper milk containers can also be used, though the majority of home gardeners employ them as protection in the field in place of commercially available hotcaps. Old strawberry boxes and even ordinary cardboard boxes such as are used by seedsmen in sending out bulbs or seeds will do in a pinch, because the plants will go out into the garden before the paper has decayed.

Thesaurus

PROPAGATE—*in gardening language refers to the different methods of continuing the growth of plants, either by seeds or by non-sexual methods, such as GRAFTING, LAYERING, CUTTINGS. LAYERS are made by placing earth over growing parts of a plant to induce root formation; CUTTINGS are severed from the mother plant and grown, with or without heat, immediately or following a rest period, in sand, soil, or other media. Some plants require special techniques before their cuttings form roots. GRAFTING is an old art with many different techniques.*

TOP-WORKING—*is the method employed with grown trees. The crown is partially cut out and scions of the desired new variety are grafted upon the old tree. The growth energy of the tree goes into the scions which soon develop into new branches, bearing the desired fruits. Since new growth is sometimes considerable, care must be taken that the scion is not broken by winds or swaying branches.*

BUDWOOD—*the material that is budded. It should be of the same season's growth and have well formed buds in the leaf axils, from which healthy shoots can develop. Budding is usually done during the summer months.*

WHIP-GRAFT OR SPLICE-GRAFT—*most common method of propagating grapes and small trees.*

The edge should be cut at an even slant and the two pieces should fit together well. The complete juncture of the two surfaces usually guarantees complete success. The extra TONGUE cut into the stock produces even better connection. When growth has commenced the strings or tapes should be cut. Like every other graft, the whip-graft must be protected by wax, to check evaporation.

BRIDGE-GRAFT—*when fruit trees or other trees were damaged by animals or the axe, leaving large parts of the bark off and exposing the white wood, these trees can be saved by bridge-grafting. Dormant wood is inserted under the bark to make connection between the parts below and above the damage and to guarantee unhindered sap flow. Should be undertaken before the start of sap flow to produce good juncture.*

GIRDLE—*ringing of trees, often done by mice and other rodents; sometimes done deliberately to prevent normal sap flow and to increase the growth of the fruit above the girdled branch. Various species react differently. Some plants, contrary to general textbook statements, have good circulation of sap, both upward and downward, in their woody stem.*

CLEFT-GRAFT—*common method for joining small scion to large understock. Frequently employed for top-working old trees or changing wild trees, such as cherries, old apple seedling trees, to desired cultivated varieties. The crowns of big trees are worked on for several seasons. Top and center are usually worked first. To secure safe results, two scions are inserted, which also prevents slipping.*

CROWN-GRAFT OR BARK-GRAFT—*often preferable to cleft-grafting, especially when the bark is hard to manage. The scion can be cut thinly and slipped under the bark of the stock. Usually a form of wedge is desired and special knives are available to cut the slit into the understock by an upward movement.*

The Earth's Organic Cover

By H. C. HAAS

The Need for a Thorough Mix of Ingredients in Correct Proportions And Properly Combined.

In a previous article the writer sought to show how the earth's organic cover has been spread to cover all the earth's surface, sea and land. Migration and sex were described as the agencies. Life has won even over extreme winter cold in the frozen wastes about the poles and it has established itself in the hot dry deserts, with forms that can best survive there.

All the individual units of the organic cover—all living creatures—need air, water and warmth, in addition to food, to live. The food carries itself about. The three others are always there. Air is everywhere, thinner on the mountain tops. Water is carried almost everywhere by the clouds, though not in equal amounts. Warmth from the sun varies, as we know, and where it is greatest the organic cover tends to become thickest, forming the jungles.

The weather has helped much in spreading and homogenizing the organic over. The earth revolves about its own inclined axis and it revolves about the sun. These movements bring about the periodic heating and cooling of all substance on the face of the earth, in two cycles, the daily and the annual, heating during the day and the summer, and cooling during the night and the winter. The heating and cooling of the atmosphere produce the winds, not without help from other influences, and the winds blow matter in dust form, inorganic and organic, living and dead, hundreds or thousands of miles. The seashore waves whipped by the winds granulate and pulverize the earth and rocks along the shores with unceasing action. The soluble parts are washed out to sea. Plant life cannot take root due to the buffeting of the waves and the lack of nourishment in the sand.

The heating and cooling of water in earth and rocks on the land surface, changing it to ice and back to water over and over again, with expansion and contraction, brings about a mass pulverizing action that all the motor driven grinders and pulverizers on earth, all the rock crushers, all the dynamite charges, all these man made devices could not hope to equal. For all these are operated with the energy of the sun's rays produced and preserved in coal and oil ages ago, the energy in the explosives more recently, the action being spasmodic and irregular, at the caprice of man, and the crushed material being used largely to make concrete for hard roads and buildings. The energy of the sun in thawing ice is exerted daily, every day of the year, first in the northern hemisphere then in the southern, over millions of square miles of land surface, not effective everywhere, it is true, but eternal and unceasing like the seashore waves, and the resulting dis-

ntegration of the so-called eternal rock has been going on since the rock was formed, for the useful purpose of providing substance to be used, in time, to take part in the building of living bodies.

Why are all the grinding, all the mixing and all the spreading necessary to the building and perpetuation of the organic cover? A wide variety of materials is needed, mixed in just the right proportions, and with complexity no end. Man cannot fathom the complexity or he would be able to produce life with only inorganic materials. All life is highly complex, both in mechanical structure and in the chemical nature of the materials used to build each part in the structure. Then there is continual processing going on in every part of the structure, microscopically minute, repairing and rebuilding, purifying, reproducing, automatic lubrication of rubbing surfaces with automatic rounding and smoothing of the surfaces—this processing, this self rebuilding, this self oiling, this self purification and self reproduction can never take place in anything inorganic. Some inkling of the complexity of all life can be gleaned on reading books like "Man, the Unknown" by Dr. Alexis Carrel and "Why We Behave Like Human Beings" by George A. Dorsey, Ph.D., LL.D., both books copyrighted by Harper and Brothers. As random examples of structural complexity let us consider the human lungs and brain, described in the first of these two books. At the same time let us remember that the full extent of the complexity is probably far beyond our ability to uncover, though Dr. Carrel and others have made wonderful progress.

Our lung surface area exposed to the air we breathe is many hundred times the area of our outer skin, very thin and delicate to allow the transfer of oxygen through it one way and carbon dioxide the other. Its fine delicate structure makes it highly vulnerable to poisonous gases, coal dust and pneumococci, all of these inescapable concomitants of our "advanced" civilization. The human brain contains twelve billion cells, connected with one another by fibrils, each fibril containing several branches. By means of these fibrils the cells associate several trillions of times.

As examples of chemical complexity selected from Dr. Dorsey's book we can tell about the carbohydrates, of number of kinds no end, of which twenty kinds were recognized when he wrote, all complex in chemical structure—the proteins, more complex, of which one, hemoglobin, has the immense molecular weight of 16,669—the vitamins, of which much has been learned with painstaking research since Dr. Dorsey's time, many of these requiring half a page to chart the molecular structure in symbol form—the hormones or endrocrines, secreted by the several ductless glands, each having a definite function, all vital, all unknown not very long ago.

The complexity found in the human body exists, no doubt, throughout all life, varying in degree and developing in different directions.

For the raw materials used to build living matter nature, or evolution, must first gather the needed inorganic chemical elements in usable form and then combine them in the proportions and in the molecular structure found in all those billions of years, and with so much trial and error, to be most favorable to life. Certain of the chemical elements, existing in abundance, are used in large amount—carbon, hydrogen, oxygen, nitrogen, calcium, phosphorus, potassium, sulphur, chlorine; others are vitally essential, but used in almost infinitesimal amounts which must be just right for each or life will sicken and die—the so-called "trace" elements, among which magnesium, manganese, copper, zinc, iodine, fluorine and cobalt have been discovered. To get all these where needed all over the earth, where air, water and sunshine, indispensable, all of them, to most forms of life, are available, nature has developed that wonderful transportation system we have attempted to

adequately describe, not using or needing any of that very limited supply of coal or oil to do it. How puny are the efforts of man to duplicate the process and make up the lack where normal topsoil has become non-existent through his own wrong and sinful practices! He mixes a few mined raw chemicals that have been found by experiment, inspired by Liebig's work, to produce a forced unnatural growth in plants, but, just as a few sounded notes will not make an opera, a few simple chemicals cannot sustain life, that co-operative life, in which several forms giving and taking from one another, some above the ground, some in the ground, and some both above and below, use over and over again material that has been in the process of being made since evolution began.

Living bodies, with all their microscopic complexity of structure, and their equally marvelous complexity of chemical composition, seen by us only in the rough, make the complexity of the Empire State Building seem rudimentary by comparison. There can be only one building just like that, and a few others somewhat like it, and they cannot repeatedly reproduce themselves millions of times over and over again, like all living bodies. Life cannot be made with simple materials like cement! Life, so wonderfully made, and so quickly and easily destroyed by that contrivance handed by Satan to man and to man only—fire!

Burning by man has been too little restrained at all times of history and at all places on earth. In that interesting book, "My Life With The Eskimo", Vilhjalmur Stefansson wrote that the spruce forests of Canada were found being widely burned when he passed through in 1908, sometimes by the Indians, who considered that the hunting for furs craved by the white man was made easier by clearing the land. Desert in production even there! We tire of making further reference to the many books describing land destruction in the United States.

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Loss of topsoil and loss of organic cover are one and inseparable. Loss by whatever agency, fire, slaughter, poison, removal of farm and ranch products to the cities with no organic return, erosion, affecting any area, affects the whole organic cover.

Just now all this world of human beings is interested in politics, defined as the art of government, or the administration of public affairs. Politics so far has been designed and intended to serve men only—the human race, and some would say only part of it. Some day men will begin to realize that the human race can continue to exist on earth as only a small part of the organic cover, that the earthworm population must also be served though it can never be admitted to the vote, that the dropping of bombs can destroy tons of life that is never reported in the news because it is not human, that the loss of all this life curtails in commensurate degree the ability of men to continue existence, that war kills not only men but soil life, bird life, insect life, and animal life—fish life and plankton in the ocean where it is proposed to blast those ships with atomic bombs, an experiment of doubtful all-around value—that the supply of everything is going to be less for all of us whether prices are raised, lowered or stationary, or whether wages are raised, lowered or stationary, that the welfare of each is indissolubly bound up with the welfare of all—men and all the rest of the organic cover included—then we shall all be happier, we and our children and our children's children.

Let us conclude with only one of many fine statements made by Dr. Alexis Carrel in his book, "Man the Unknown". We can heartily agree with that statement and with most others in the book, not quite all—"The sciences of inert matter have made immense progress, while those of living beings remain in rudimentary state."

Vegetable Growing

One of my more radical ideas.

WITHOUT encroaching on the domain of Roger Smith, our vegetable grower, whose series and booklet have received enthusiastic comments from readers through the years, I should like to point out a few general things that are not often discussed in *Questions and Answers,* where many vegetable problems are brought up, namely *spacing.*

There are two kinds of vegetable gardens, the strict row system which is planted for easy cultivation, and the oldfashioned bed system. If you go still farther back, to the mediaeval monastery, you will find that there vegetables, herbs, and flowers were planted side by side, utility and beauty not being separated by the discriminating monks. I think they had something there which many modern gardeners fail to observe—the beauty of vegetables. What is more decora tive than celery or celeriac plants? How beautiful does the light green of Swiss Chard stand out between the reddish greens of beet tops and the furry blue green of my favorite salsify! And what a nice sight in late fall when curly savoy and glistening red cabbage lead the eye to the border where the chrysanthemums flower! I, for one, therefore followed the bed system because it allows me to alternate flowers and vegetables in varied rhythms.

Just the same, a system must be followed because vegetables mature at different times and because the good gardener does not permit unshaded spots and empty space while anything can be grown. The beginner thinks this a difficult task. And it is not easy when potatoes and corn form the

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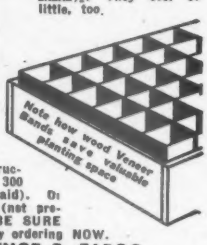

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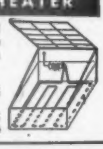

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main crop as they do in so many gardens; but where diversified vegetables are grown, the job is not half so serious.

The crops which stand out the entire year are bulbs and roots. You will have radishes, beets, and carrots that mature earlier, but by giving the root crops a good foothold you not only provide the storage cellar with many a boiled dinner and fresh vegetable for salad during the winter, you also give your garden its stable form. The warm weather crops, on the other hand, which end when the frosts come, peppers, tomatoes, corn, pumpkins, cucumbers, and the like, take the second half of the growing season, beginning usually by the middle of May. These crops are not taken out before the fall spading. Thus you really have to think now only of the quick growers that mature during summer or even in spring.

These are spinach, lettuce, radish, peas, beans, and half of the cabbages. Early in the year you need fresh things, and a bed or row of red radishes is usually just enough. When it is taken out, peppers and tomatoes may follow, just as cucumbers or corn may be planted after spinach and early peas. By that time the leftover compost or freshly made material can be incorporated safely. Thus we really have no planting problem left but summer and winter radishes, late beans, and cabbages, which the wise gardener always interplants with lettuce.

In the row system you have to provide space for summer radishes and later ones, while in the bed system these thrive abundantly on the sides or slopes of the beds. Wherever there's a space, you can stick a seed in and get a big radish later in summer or for winter storage. Lettuce and cabbages of all sorts are grown side by side under any sound system. When the first are eaten, the second have spread, filling the space—while the beans may be treated like summer crops, such as tomatoes. Especially is this true of pole beans. They can be grown after

spinach, radish, lettuce, and onion sets, just like peppers and eggplants, okra and cucumber. Few people like eggplants, but they are decorative and worth having for a sight rather than a dish.

In the row garden you take care of both expansion and succession; planting in such a way that an empty row will either be taken up by a succession crop or taken over by the spread from the adjoining rows. If, for example, you have broccoli or Brussels sprouts, you must give them some space. Early beets and radishes next to them will open such a space. If you grow rutabagas, it is best to do so during the later season so that you can store them. In summer, better fresh vegetables are available.

Considering these facts, you will notice that there are more crops that mature during the second half of the year. That leaves you some garden space during the first half. You want to plant some non-vegetables in that space? Nobody can eat all the spinach and all the spring onions and radishes that you could grow where later there will be corn and tomatoes, beans and cucumbers, peppers and turnips and rutabagas and late cabbages. So what are you going to grow on these beds during the first half of the year? If you think the mediaeval monks and I have something to recommend them, I'd give the advice that you fill a few of those beds with flowers.

You can get plants from the growers and in the seed stores, of course, but if you start now when the magazine reaches you, you can still put out some of the quick growers and early bloomers, of which I should call attention to Clarkia, a beautiful flower of the fuchsia type, which is much too little known. And next fall when you plan for another season, consider if you don't want to enjoy some tulips first before you get around to planting peppers and savoy cabbage. I have done so and never found any war among my plants; for vegetables and flowers get along with one another quite well.

Meyer.

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Bats and the Composter

Sir Albert Howard sent us a letter received from Captain Moubray in Southern Rhodesia. This South African compost farmer is well known in compost circles. His letter reads as follows:

"Dear Sir Albert:

"I don't know if I have ever written you on the subject of our local bats. Some fifty years ago I estimate the population of bats in our valley to have been perhaps 500; to-day it must be nearer 5,000. The reason for this is that during European occupation a number of small gold mines have been worked out and when these were abandoned, as all have now been, shafts and tunnels were left. Nearly all of these are now inhabited by bats. I have a tunnel which I put into a small hill right among our buildings, I was experimenting with this for cold storage purposes. It did not work out. In the two years since it has been idle varying numbers of bats inhabit it. My police boy keeps a record of these and some other tunnels and we get a very rough estimate of our bat population.

"Most excreta from bats in the wet season shows mosquito remains, so the bat must be of some use in reducing malaria. I don't know if you have ever seen a book by a Dr. Campbell who built bat lofts in and around a swamp in America. Not only did he claim to have enormously reduced the malaria, but he sold considerable quantities of bat manure from the lofts. We have deposits of bat manure in caves in the country, but if it is not taken out fresh, most of the nitrogen has been leached out and it is not of much value. I often wonder if owls eat bats. I have seen them coming out of the same old shaft.

"I wonder again what limits the bat population. Is it the number of habitations available or is it the food.

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Our old subscribers can renew now at the old rates and we will gladly add their extension to the date when their subscription WOULD expire. You can beat the rise in prices by sending in your renewal ahead of time, at the old price, if you do so before May 31.

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Obviously in the case of this valley it was the places they could live in, as there are no natural caves and the insect life is very plentiful.

"Does the cat tribe eat bats? I have seen a cat playing with a bat, but never seen it actually eating one Rats and snakes probably account for a few. The artificial bat roost should then be cat, rat, snake, and owl proof. This can be done by putting openings between slats some way up. Bat manure mixed in the compost heap should be valuable."

Bat manure is, of course, very rich in nitrogen and was at times sold as Bat Guano. When the big caves in our own Southwest were opened enormous deposits of these droppings were found and mined.

The matter is different when it comes to bats in your own attic. Dr. Meyer has a story to tell on that score. When he bought his Pennsylvania farm and entered one of the upstairs bedrooms with a lighted candle, the amiable young bats started whistling behind the wainscoting. Some blind little ones stuck their heads through the cracks. What was he to do? The odor was not agreeable, but murder was not in his heart. So he permitted the young bats to grow to maturity and to whistle every night. Then the real work started. Trying to find where they got into the attic. For weeks he roamed over the roofs and under the eaves with putty and asphalt. The bats flew out in the evening and returned during the night. By careful watching he closed finally all the cracks and the bats could not make their way out. Then he caught them in a bag and transferred them to the old smokehouse. But he says the house still is a little batty. D

Plowman's Folly

By EDWARD H. FAULKNER

While we do not quite agree with Mr. Faulkner's main theme we believe this to be a valuable book which should be read by everyone interested in organic farming and gardening. There is much interesting material in the book showing how to increase the humus content of soils. $1.00

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THOSE LATIN NAMES AND THE FOXHOLE

Q. I enjoy the magazine very much, also the Book Club and *Pay Dirt*. I have only one kick. If you authors, Rodale, Howard, Pfeiffer, etc. must use so many technical terms, Latin names, etc., why, oh why don't you explain them in footnotes for the lay farmer? I like to call a pig weed a pig weed. How many dirt farmers would know it by Atriplex or orach? Next June you may need a foxhole if many readers take Roger Smith seriously and find they have planted a nice crop of pig weeds (orach).

W. F. L., Cardington, Ohio.

A. When we use technical terms we try to make them clear, and over a period of years everyone will get the drift. You seem to be doing very well yourself. But take your pigweed now. That is in common language a weed of a different plant family, not a goosefoot, like Lambs' Quarters, orach, or perennial spinach, but a member of the amaranth family. Other names for it are soldier weed, prickly careless weed, rough pigweed, Chinaman's greens, etc. Also tumble weed, tumbling pigweed exist for this one. There just is no way of making things definite without using the real name as it is accepted. But Roger Smith can take it, we hope. Wait till you get his

Dr. L. C. Dolson's Yard in Cedar Rapids, Iowa — Dolson

Garden Beyond The Rainbow in the Gardener's Book Club. And thanks for the compliments.

—o—

NUT TREES

Q. I find many different kinds of nut trees mentioned in the various advertisements I receive. Which should I grow? Do Pecans thrive as far North as Connecticut? Can English walnuts be grown where the black walnuts thrive? And what about Filberts?

H. G. P., New Haven, Conn.

A. Pecans are out in New Haven. English walnuts grafted on black walnut may work out all right, but you cannot always be sure. The risk is worth taking and an Eastern nursery or a Plains State nursery should be helpful in getting hardy stock. All success in this line depends on the original home of the scions or budwood which your tree contains. Filberts are an improved variety of the well-known hazelnut that grows wild in Eastern United States. They are commercially grown in the Northwest, but can be grown in the home orchard, especially if you allow them to grow in bush form. While a tree out in Washington may produce almost a ton of hazelnuts a bush will produce a bag in the East, without much trouble.

—o—

COMPOST IN COMPOST?

Q. Can finished compost be substituted in place of the layer of manure in construeting the compost pile?

W. S., Ashland, Pa.

A. Finished Compost can be used to bring bacteria into the new material. In other words, it can take the place of the sprinkling of earth. But the bacteria need growth food in the form of nitrogen in order to build up their own body protein. This *must be supplied separately* if the heap is to break down as it should. The temperature reached shows if the break-

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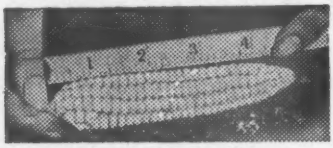

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By DR. THOMAS J. BARRETT.
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ORGANIC GARDENING — EMMAUS, PA.

ing down process is going on rapidly or slowly. If you used compost instead of manure or another source of nitrogen, such as bagged chicken manure, hoof and horn meal, dried blood, etc., you would not get proper heating.

—o—

HUMUS OR COMPOST?

Q. Can you tell me the difference between humus and compost?

R. J. W., Santa Barbara, Cal.

A. Humus is, strictly speaking, a product of nature, of varying composition, and almost equivalent to "organic matter in the soil". It is the result of broken down plant and animal substances of organic origin.

In the language of the fertilizer business and the advertiser, *Humus* means organic materials, largely of plant origin, that are apt to develop into humus when put into the soil. Such Humus preparations are sometimes quite useful when no homemade compost is available.

Compost refers to the process of handling plant and animal matter in such a way that the raw materials break down under bacterial activity in heaps, pits, boxes, etc. Well finished compost, that is, compost which has gone through a stage of bacterial decomposition and a stage of fungus digestion, may approach in structure and effect on plant life the natural humus. At any rate, well made compost, becomes humus when it has been incorporated into the soil.

—o—

CORN

Q. Can I grow ordinary corn in the garden? What is the difference between Corn, Hybrid Corn, Sweet Corn, Popcorn, etc.?

J. L., McT., Marietta, Ohio.

A. You can grow field corn in the garden, but if you want it for eating, either raw or cooked, you had better choose sweet corn. There are numerous varieties of corn, which fall into four main groups, Flint, Dent, Sweet,

and Pop, as far as the gardener is concerned. Hybrid corn came into existence by deliberate breeding over thirty years ago, but has taken a hold only within the last decade. By utilizing the "hybrid vigor" which nature displays every time when two strains are mixed, a matter which our contributor Haas so ably discussed in the March number, corn growers could increase their yield by as much as twenty to forty per cent. There are also some Sweet corn hybrids available, which you will find in the catalogues. Don't go after the biggest ears, but after the sweetest. Many of the best varieties are among the Golden Midgets.

—o—

STRAWBERRIES AGAIN

Q. I found an advertisement for strawberry seed. Should I grow my strawberries from seed or should I order plants? And how should I prepare the soil?

Miss E. P., Baltimore, Md.

A. The strawberries you will get from seedlings may vary in quality. But certainly, you will not get enough berries from the small-fruited variety that is available for sowing. You should order two or three varieties and, under Maryland conditions, will have no trouble whatsoever. It is excellent strawberry country. But strawberries need plenty of humus. It used to be said that strawberries can be grown successfully only on newly cleared land, write Cooper and Vaile of the Arkansas Experiment Station. They found that by *adding humus in any form,* strawberries can be profitably grown without trouble. Make compost and add it liberally, two to three inches worked into the beds or hills. Then apply a straw or hay mulch, which you can ultimately work into the ground too. Further details have been set forth in recent numbers.

—o—

COMMERCIAL BULB GROWING

Q. I am interested in growing flower bulbs of different kinds on a com-

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P. O. Box 115X, Streator, Illinois.

mercial scale. Can you tell me where I may find printed information? I shall appreciate any other information you may give.

C. R. C., Potosi, Mo.

A. The best information on commercial bulb growing is still contained in Bailey's Cyclopedia of Horticulture which you can probably look up at a public library, in the six volume edition. There is a three volume edition which you may secure from most seedsmen who advertise with us.

Further valuable information you will find in the U. S. Department of Agriculture Year Book for 1937, which you can obtain from the Supt. of Documents, Washington, D. C. for $2.00. You might also write to other growers such as appear in the catalogs or still better, visit them. You will no doubt start on a small scale and see how things work out, because Missouri has not a long growing season and is, therefore, in a less favorable competitive situation than the Southern and the Pacific coast states.

We just had a visit from a war veteran who plans to go into bulb growing and who spent three months visiting growers in Florida and California. From a practical point of view, the Gulf Coast states are best because land prices there are not so high.

—o—

BASIS FOR COMPOST

Q. The opinions seem divided on where to build a heap. Should the foundation be earth or stones or brush?

H. E. M., Lewistown, Me.

A. Earth is best, because a heap built on earth is in touch with the soil from which earthworms can migrate up. Also, the bacteria in the soil find their growth unchecked. Brush is hard to handle, it does not break down at the same rate as the other plant matter and is in the way when the heap is to be turned or moved. But since it is good to get some air in from below, use corn-

stalks or straw at the bottom. If sod is on the ground, you can leave it there; it will rot rapidly under the heap and form the first layer of plant matter. Boards are unsound because they permit all sorts of animals to find shelter. A heap with a board foundation may attract rats, which otherwise do not go into compost heaps. Stones and cement are out. They can take no part in the practical or biological work of compost formation. But you may use hollow tiles (or some other suitable material that permits air circulation) for the sides of the heap, if for some reason or other you want to build.

—o—

HOUSE PLANTS

Q. Where can I get Begonia, Fuchsia, and Geranium seed? How should I start them?

Mrs. O. L., Memphis, Tenn.

A. Our advertisers carry in their catalogues several collections of these seeds. Some have quite a number of unusual varieties too. These seeds, like most others, had best be started in a slightly acid medium. You mix peat moss and sand and sifted garden soil in equal parts, add on top a mat of finely crumbled sphagnum moss, soak the material, sow the seeds, cover the pan or flat with a glass and keep it shaded until the seedlings appear. Peat and sphagnum have an enormous water-holding capacity, but allow at the same time sufficient access of air. This prevents damping off. The fact that peat and sphagnum are acid also counteracts diseases. You must, however, occasionally lift the glass to allow access of air. Fuchsia and Geranium should have about 65°, while Begonia can easily take 70°. None of these seeds need be covered; just press them into the moss. When the third real leaf has appeared, you can transplant them into a flat with a similar mixture. It depends on circumstances when you want to put them into small pots or out in the open.

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NOTICE TO READERS

The ORGANIC GARDENING Magazine does not accept advertisements of chemical fertilizers or other fertilizers which we feel are too strong for the land or poisonous sprays. We do not deny firms access to our advertising columns if they handle chemical fertilizers if they have another acceptable product to sell. The reader should be careful in accepting such advertisements. Our responsibility extends only to the product advertised in our magazine. It does not extend to all of the products handled by a concern.

ORGANIC GARDENING **Emmaus, Penna.**

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WE have worked out a convenient plan to issue a gardening booklet each month, on some phase of horticulture dealt with in the organic manner. These booklets sell separately for prices ranging from 25 cents to $1.00, but are available to members of the Gardener's Book Club at 25 cents each or $3.00 per year.

A list of the present year's publications shows what a wide range is covered by the Gardener's Book Club. We first issued *The Fruit Orchard,* abounding with practical information and unusual data on fruit growing. The next booklet was derived from our editorial work in Organic Gardening, bringing *Questions and Answers on Compost.* Then a small encyclopedia was written by Dr. Meyer on *Leaves And What They Do.* This booklet was richly illustrated, as was Professor Headstrom's book, *Animals and the Gardener,* which followed as No. 4. During the fifth month, members were surprised by a beautifully printed book, dramatically written by J. I. Rodale, entitled *Sunflower Seed —The Miracle Food.* It goes without saying that so much interesting information could never be packed in magazine articles. Then plant breeding had to be looked into, and Mr. Roger W. Smith wrote *Luther Burbank.* During the seventh month, members received one of the most astounding gardening books ever written, *Root Development of Vegetable Crops* by Professors Weaver and Bruner, a well-known classic and practically unavailable until this reissue in condensed form. But nothing of the important substance has been trimmed off the book. No. 8 is the famous earthworm classic, *Our Friend, The Earthworm* by George Sheffield Oliver, which has long been out of print. No. 9, a series of new and selected works by Sir Albert Howard, entitled *The War in the Soil,* represents a magnificent summary of the organic cause.

No. 10 is Miss Speiden's *Seedlings;* we believe it is the first book exclusively devoted to this important problem—how to start a garden. It is well illustrated and sells separately for 50 cents.

Next follows Dr. Pfeiffer's *Weeds And What They Tell,* an invaluable guide for the gardener and would-be buyer of land. The last issue is Roger Smith's *Garden Beyond The Rainbow.*

Most of these books sell separately for 50 cents, the *Earthworm* book costs $1.00. Yet, by joining the Gardener's Book Club you obtain *TWELVE* such books for $3.00 or 25 cents each.

In a few years of steady membership you will be able to collect a veritable garden library at very low cost. And then—there is always the added pleasure of the surprise: "What will next month bring?"

The Gardener's Book Club has proven its value and we can already give you better and more beautiful books as the membership has steadily grown. Be sure of your place in *The Gardener's Book Club* and send your remittance of $3.00. You will immediately receive the numbers already issued this year and then the new ones, twelve books in all—for only $3.00.

GARDENER'S BOOK CLUB
ORGANIC GARDENING — EMMAUS, PA.

AN AGRICULTURAL TESTAMENT

Sir Albert Howard
C.I.E., M.A.

By Sir Albert Howard, C.I.E., M.A., Formerly Director, Institute of Plant Industry, Indore, and Agricultural Adviser to Central India and Rajputana.

This is a remarkable book published by the conservative Oxford University Press. It gives the complete history of the Sir Albert Howard method of making compost. It describes the events in the West Indies and in India that led up to this epoch-making discovery. After reading this amazing book, if it does not thoroughly convince you that the organic way is the best, your money will be cheerfully refunded. Many gardeners date their conversion to the ORGANIC METHOD from the time of reading this Testament.

This is the recognized standard text book for gardeners and farmers who wish to change from the use of ordinary chemicals to home-made organic fertilizer. Howard has forty years of active experience in the field of organic fertilizers and is the accepted leading authority on the subject.

We have arranged to print the book in the United States and have been able to reduce the price to $3.50 POSTPAID. — Canada and Foreign 35c extra.

ORGANIC GARDENING—Emmaus, Pa.

Pleasant Valley

By Louis Bromfield

When the war came, this famous author acquired three run-down Ohio farms. Here he tells us what he found, what the former owners did with their land and their lives, and what the Bromfield family and their helpers made of it. There are many interesting characters, plenty of humor, much of wisdom in this book.

A DRAMATIC STORY, WELL TOLD, BEAUTIFULLY ILLUSTRATED.

All Organic Gardeners WILL LOVE IT.

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Trampling Out The Vintage

By Joseph A. Cocannour

A remarkable book written by a teacher of agriculture who describes farming and gardening in backyard sections of Oklahoma as well as in China and the Philippines. This book will be read with sustained interest by COMPOSTERS. $2.75 postpaid.

THE COMPOST GARDENER

By F. C. King, with a foreword by Sir Albert Howard

An experienced English gardener tells of his method of raising food crops by the organic method. The book is so revealing about the English gardening methods that we imported it for the benefit of compost and health-conscious America. Cardboard covers.

$1.50 Postpaid

ORGANIC GARDENING — Emmaus, Pa.

Organic Gardening — Emmaus, Pa.

The Garden Book of the Year

A Review of

Pay Dirt

By WALTER MAGNES TELLER
(Author of "What is Farming?")
in The Progressive

O I 48 2YR EE121
MRS JAMES INGLIS
2301 HIGHLAND ROAD
ANN ARBOR MICH

I'll tell why *Pay Dirt* strikes me as one of the most interesting and important books on farming. It is because this book explains a substantial aspect of the revolution in farming and gardening which is going on all over the world. It deals with the problem of maintaining and, where necessary, creating fertile soil.

Sir Albert Howard, author of the already classic *An Agricultural Testament,* in his introduction to *Pay Dirt* describes a fertile soil as "the formulation of healthy crops, healthy livestock, and last but not least, healthy human beings. By a fertile soil is meant one to which Nature's law of return has been faithfully applied, so that it contains an adequate amount of freshly prepared humus made in the form of compost from both vegetable and animal wastes."

Rodale's *Pay Dirt* is a book for the amateur gardener, the professional farmer, and the more serious moments of the general reader. Mr. Rodale argues the theory and practice of compost with both passion and reason for he is both student and farmer. He clearly and simply describes the biologic life of the soil, the Howard method of scientific composting, the dangers of chemical fertilizers, the relationship of health or disease to food, and his own notions of good and bad farming practices.

If Edward Faulkner's *Plowman's Folly* left you confused on whether to plow or not to plow, I recommend reading *Pay Dirt.* Experience taught me, like thousands of farmers, that corn, for example, likes plowed land; that I must plow occasionally to control certain weeds. I think Mr. Rodale has shown why this is so. And he has also said and demonstrated things about the control of insect, plant, and animal pests which impress me very much. I don't think my farming will ever be the same. I think I may have bought my last bag of superphosphate. I want to see a manure loader in action.

Mr. Rodale has done a fine job of bringing together such intimately related subjects as crop production, animal husbandry, soil erosion, food, nutrition, and health, which have become fragmentary units, each in the hands of a group of specialists.

No reader of Organic Gardening can afford to miss this book. A third large printing is on the way. Order from

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ORGANIC GARDENING

MAY 25¢ 1946

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COMPOST — How To Make It

A pamphlet of 64 pages answering questions about the best way to make compost. This book consists of material that has appeared in Organic Gardening from time to time. 25c

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A booklet of 48 pages which discusses the health-giving values of breads and cereals made with organically produced and stone-ground grains. Contains many recipes of bread, scones, breakfast cereals, unleavened breads, etc. 25c

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(3 Debates in the House of Lords)

A pamphlet of 55 pages which gives in complete form the two thrilling debates held in England on the advisability of forming a Royal Commission to check on the Sir Albert Howard method of farming and gardening. It is chockfull of amazing information and reads like a novel. 25c

Vest-Pocket Vegetable Guide

By ROGER W. SMITH

A little booklet of 64 pages that discusses the growing of 40 vegetables in the organic manner. For medium northern climate. 25c

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By CHARLES DARWIN

This is a pamphlet which represents a condensed version of Darwin's famous classic on the earthworm. It contains the most important parts of his revolutionary work and is a MUST for every organic gardener and farmer. 25c

The Fruit Orchard

This book deals with the various aspects of Organic Orcharding; how to mulch, how to combat insects without sprays, what to consider about varieties, pollination, sports. Illustrated. 25c

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By DR. H. MEYER

Over 20 illustrations. A true encyclopedia of the leaf, the source of all organic substances. Invaluable for the gardener and lover of plants: Leaf Color, wilting leaf, reactions to light and water, insect-eating leaves, leaf mold, acidity, medicinal and culinary qualities, etc. A handy reference book. 25c

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By RICHARD HEADSTROM

The charming discussion of the gardener's animal friends and enemies, well illustrated, written by the prominent New England lecturer and teacher. 25c

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By J. I. RODALE

A wonderful survey of what sunflower seed does to the human body. Amply illustrated, dramatically written, full of unusual information, supported by experiment and experience. 25c

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A lucidly written, splendidly illustrated book on the great plant breeder. You will get a useful introduction into the wide realm of plant breeding by one who is himself a successful gardener and much-loved garden writer. 25c

Root Development of Vegetable Crops

By Professors WEAVER and BRUNER

You will be amazed to learn how far down roots of our common garden vegetables reach and how wide they spread. All the cultural practices that connect with root development are here discussed on the basis of twenty years of special research work at the University of Nebraska. Indispensable handbook. 50c

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The famous Earthworm classic, first published in three volumes, unabridged, and most comprehensive text. $1.00

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Mr. Rodale, always interested in natural methods of obtaining health, has made a startling discovery regarding pressures we exert on parts of our body during sleep, which cause stubborn conditions of neuritis in the fingers, arms, shoulders and neck. Miraculous cures have been obtained by persons who have followed the simple rules explained in this book, which is also quoted by medical authority. 25c

The War In The Soil

By SIR ALBERT HOWARD

An original contribution by Sir Albert brings the compost question up to date. This is an indispensable supplement to his "Agricultural Testament". 50c

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By EVELYN SPEIDEN

An experienced gardener tells us how to start seedlings and how to prepare the garden. Many illustrations and much valuable information even for those who have gardened a long time. 50c

Weeds And What They Tell

By DR. E. E. PFEIFFER

A rich source of information on weeds and what they tell about your soil. If you notice changes among your weeds, has your soil become acid or alkaline? What do wild carrots indicate as to fertility? Such questions are answered and illustrated by many pictures. 50c

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